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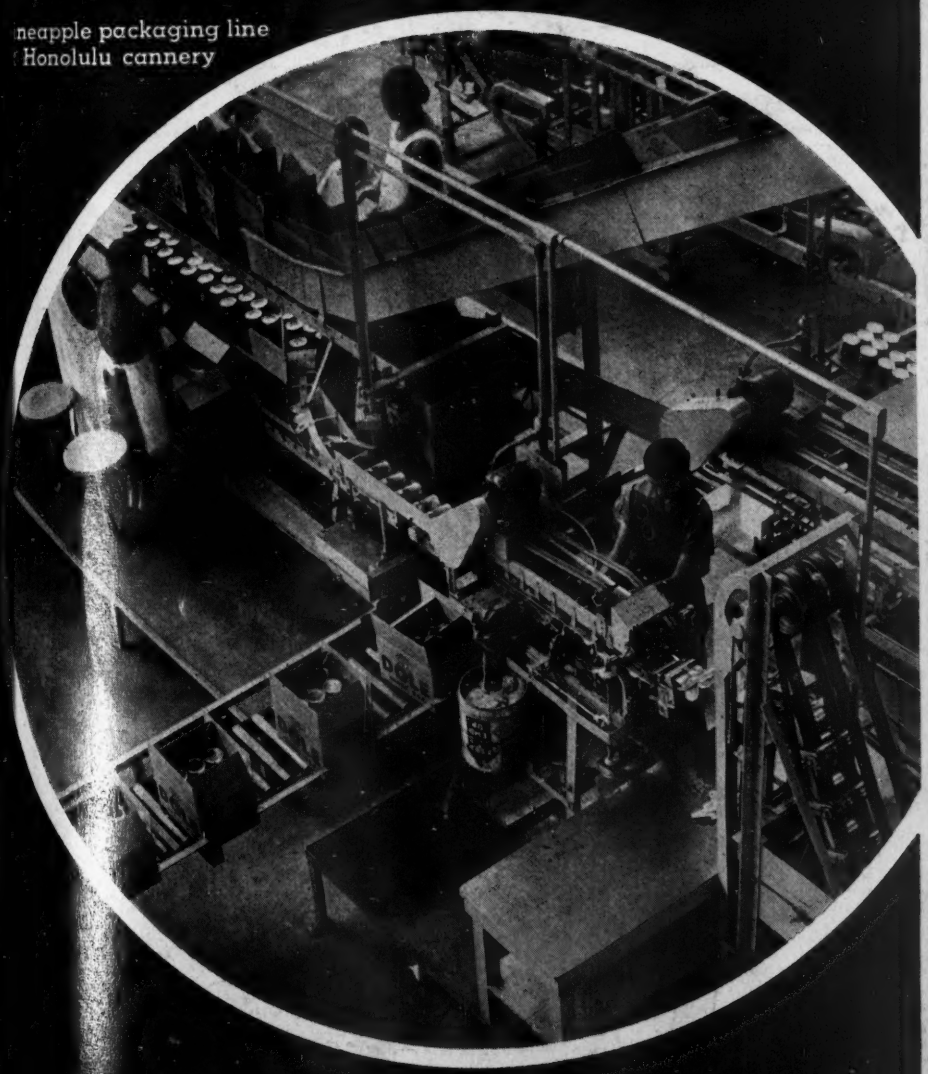
FOOD INDUSTRIES

NATIONAL EDITION

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION



neapple packaging line
Honolulu cannery

APRIL 1947

Salting Herring In Iceland

Three New Ways To Use Food Wraps

Cold Storage Rooms Used For Freezing

Commonsense About Evaporation

Solvent Extraction Of Cottonseed Oil

Who Is Liable For Trichinosis?

Puncture Test For Container Strength

McGRAW-HILL PUBLICATION

IF YOU PROCESS *Foods*

—let PATTERSON MACHINERY help you do it better!

Richard L. Carney
President

SATISFACTORY PATTERSON MACHINERY

EQUIPMENT HEADQUARTERS FOR THE PROCESSING INDUSTRIES

THE PATTERSON FOUNDRY & MACHINE CO.
EAST LIVERPOOL, OHIO, U.S.A.

IN CANADA THE PATTERSON FOUNDRY & MACHINE CO. (CANADA) Ltd. TORONTO, ONTARIO

Opposing Attitudes on Progress

HERE are two incidents, of marked contrast, where management takes diametrically opposing attitudes toward that which is new.

"What do you think of the new ——— process that was announced last month?"

"We are very much interested in it. As soon as the folks make up their mind just how they want to sell or license it, I think we may be one of their customers."

"Won't that mean scrapping an entire department in your plant?"

"Sure—in three plants."

"Will your directors go along on this?"

"Oh, I think so. We are very much interested in anything that makes our plants, processes or products obsolete. In fact my job is to find things that make them obsolete. If the new things come from outside or from our research department, it makes no difference. As long as they really obsolete anything we have or do, we are interested. And generally we want to build or buy them."

The foregoing conversation took place with the Vice President in charge of Research and Development of a very successful food company. Processes employed by this multi-product concern are today nearly all continuous processes. They appear to be about as nearly automatic as would be possible to make them. Yet the V. P. is on the constant search for better ways.

That company's concept of research, as a hunt for ways to make obsolete the present, is far different from the more common attitude—and far more enlightened. It is the diametric opposite of another conversation with an officer of a big company where a very low-priced new type of single use container had been made available:

"I'll oppose the adoption of that new container in every way I can. We don't need it. The industry doesn't need it. We don't want it. We don't want to see it gain even a toe hold. Why! It would make obsolete almost every machine we have in the plant! Do you realize that we have three machines, costing $100,000 apiece, that would have to be scrapped if that ——— container gets started? And what for? Why should we throw away half-a-million dollars of perfectly good equipment that has 20 more years of life just to give the consumer a half-a-cent price reduction? What the consumer doesn't know won't hurt him."

"But, won't somebody else come along who doesn't have to scrap anything? He will use the new container and competition can force you to use the new container."

"We'll see to it that he never gets a chance to get started."

"How?"

"There are ways. He'll find out soon enough."

Commonsense Must Apply

To be absolutely realistic, if the latter chap could actually pursue his monopolistic policy his company would probably make more money—for a time—than the first company that has the enlightened research policy. But, for the long pull, the progressive concern that seeks better things to make its old ways and existing equipment obsolete is the one that gets the backing of astute investors. Of course, there are certain commonsense principles that should be applied. The new thing should be so much better than the old that it will be profitable to scrap the obsolete. It is also advantageous where possible to have temporary exclusive rights to the new, whether by patent or by contract.

Opposition Gets Nowhere

The reactionary concern did not stave off the adoption of the new container by its competitors, although it put up a terrific and costly battle involving some very dirty fighting. It was ultimately forced by sheer competition to use the new container in order to hold its volume of business. But it now pays a higher price for the inevitable.

The trend of the time is toward a greater number of large multi-product corporations in the food processing industry, and the first of the two attitudes reported here shows one of the forces that accelerates the trend. Yet there is no reason at all why smaller companies cannot grow in competition with the bigger ones. I know of one small concern that is aggressively seeking new methods of production. It is still a small concern, but even in prewar days it caused no end of worry to its larger competitors because it could meet all of the big fellows' price cuts and still make money.

The fundamental difference lies largely in attitudes of management.

H. V. Burton

EDITOR

The Talk of the Industry

• PRESIDENT TRUMAN'S proposal to end the drafting of young men for military service does not quite add up. If he has predicted an increase in voluntary enlistment on the theory that a business recession is ahead and that unemployed young men will seek jobs in the Forces, it is likely that our national defense will be impaired.

• ON the other hand, there is a distinct change in the economic tenor of the time. During a recent "Take 'em off!" type of entertainment for one sector of the food industry, the total number of coins thrown upon the stage was small enough to be held in the palm of one's hand. A year ago at the same event it is related that over $2,000 in quarters and half-dollars was showered upon the entertainers. Of course, it is barely possible that the audience was closer to the age of serenity, or even that the entertainers may have been older.

The economic theory seems to be the more plausible, yet there was no local unemployment and food processors thereabout have been forced to operate bus lines to nearby towns in order to get enough help.

• ONE way to really make a profit has come to light. A small company with a relatively big sugar base has all but ceased operations and resold most of its sugar "for a suitable consideration" to a large well-known producer of a nationally distributed item. This is much more plausible than the yarn now going the rounds about the chap who is said to have flimflammed the OPA into giving him a sugar quota to preserve milk that, he averred, would otherwise be wasted. The extra-sweet sweetened condensed milk, so the tale goes, was then sold to a candy maker for caramels. Mebbe so, but it sounds goofy, especially since the story grows each time we hear it. Last telling had it that the extra-sweet sweetened condensed milk was spray-dried and sold in powder form in the ratio of about 1 lb. of milk solids to 100 lb. of sugar.

The first yarn, however, illustrates the problem of the national advertiser. He must have the goods available at all times regardless of cost unless he wants to permit the competition to sneak in. The smaller outfit that sold most of its sugar quota might be one that relies on price alone to effect sales.

• ONLY 26 years ago botulism hit hard. Remember the furore? Remember how in the ensuing years every scientific effort was directed toward eradicating it? And now it is a part of our national defense. We have learned how to produce botulinus toxin in pure form. One ounce is said to be sufficient to kill everybody in the United States. One estimate is that an ounce is enough to kill 180,000,000 persons. Surely that a particular figure is purely coincidental, but the estimator fails to advise us how to persuade them to swallow the toxin.

• EMPLOYMENT figures worth remembering: non-agricultural workers in November, 1946 were 49,140,000, according to the Bureau of the Census. Unemployed were estimated at 1,930,000 of which 700,000 were veterans of World War II. Total number of civilian employees of all sorts was 57,040,000. Agricultural workers were 7,900,000 in November. The floating workers seem to be about 720,000.

• IF one can believe all, the wonders of quick freezing surpass all imagination, e.g. frozen, brined cherries, and frozen finnan haddie.

Hors d'Oeuvres

• National Fisheries Institute asks what would happen to the fishing industry if the per capita annual consumption of fish were increased by 5 lb. Bet whatever is the answer, it's good.

• *National Baby Week, sponsored by the manufacturers of all baby foods, is slated for the week of April 26 to May 3. Their slogan, held over from last year, is "Give your baby the right start in life." Instead of holding on to their slogan again this year, sponsors are being urged to lend it to all those newcomers to the frozen food business.*

• Mirror-polished blades, plastic handles in varied colors, and a slimmer look overall—that's how the manufacturers of the de luxe Household Cleaver and the Household Cleaverette describe their two new products. But don't let them fool you, brother, they are still cleavers.

• *National Can Co. and Continental Can Co. are among the multiple tenants of WAA's aluminum forging plant at Cannonsburg, Pa. The good neighbor policy is beginning to show results.*

• Out on the West Coast, Advertisers Bill Horsley and Harold Stone are advocating Bed-to-Bed pay for the bosses, whose minds are on the jobs from waking to shut-eye. Frederick Othman, Washington columnist, wants pay for sleeping and eating, with time-and-a-half for naps and snacks, because these operations prepare him for work. Capitalists, all three of them! When did you ever hear us worker groups lousing up our demands with any reference to work.

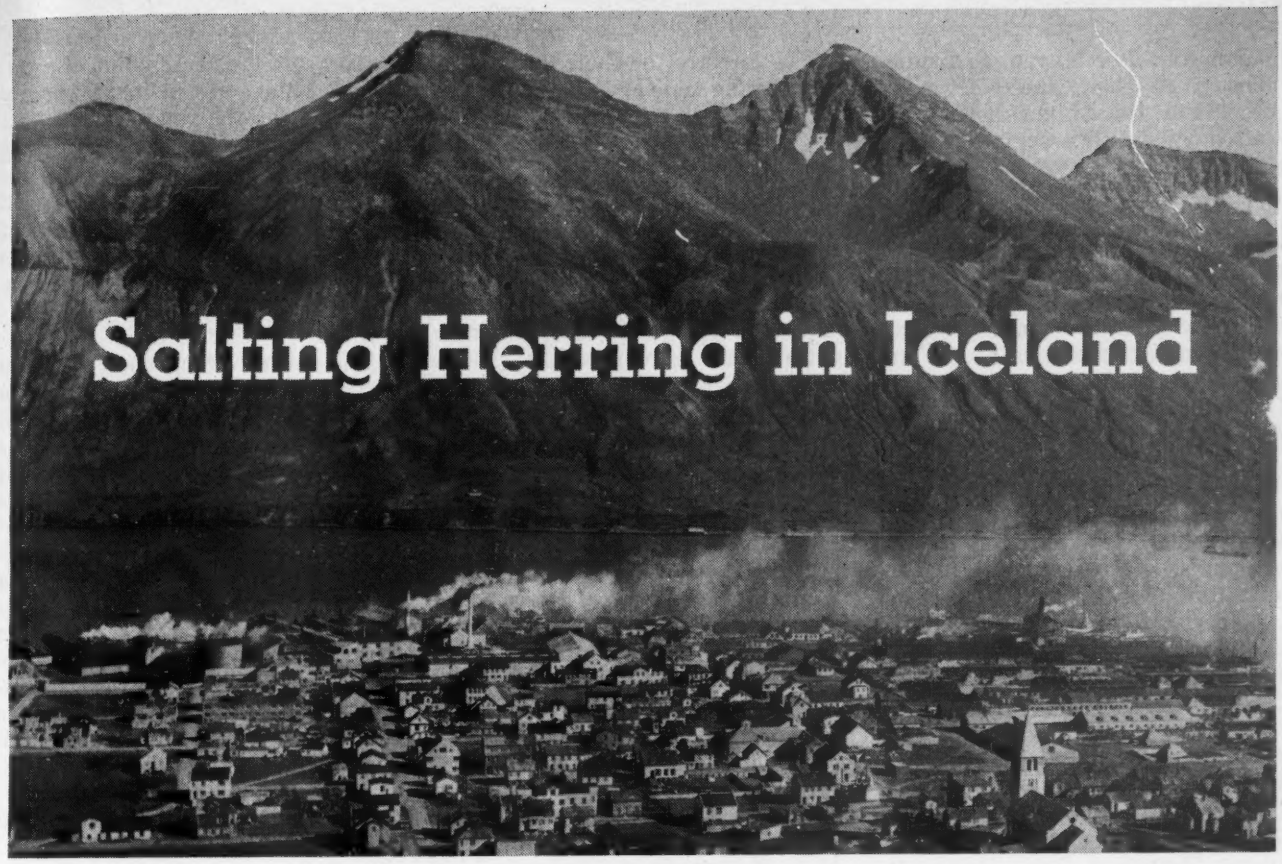
• *War developed laminated paper bags are said to be so strong and water proof that flour packed in them has been floated harmlessly over Niagara Falls. This will be a big help in distribution, too.*

• An ad agency promotion piece tells us that it was early in 1900 that "G (for George) Washington," a distant relative of the first President, "discovered the instant coffee that bears his name." It makes us nervous to think of the consternation if the G. had turned out to be, let us say, (for Gerard), or (for Geraldine).

• *The food industry is building up to another war. The poultry raisers are promoting turkey for Easter, same as Thanksgiving and Christmas. How the ham producers are going to take this is strictly moot at the moment.*

• Kentucky's anti-saloon league reports 92 of the State's 120 counties as totally dry, only 14 totally wet. Official reports of the moonshiners have not yet been tabulated.

J.A.J.J.



Salting Herring in Iceland

The unusual quality of Iceland's large, fat and tasty herring has helped the country to establish a world-wide reputation for the highly prized salted product. Excluding cod fish, it is the largest single export item

By G. J. SIGURDSSON, Iceland Fish Industry Board
Reykjavik, Iceland

TOWARD the end of June every year there is renewed activity in the Icelandic fishing fleet. The herring season is about to begin, and for the next two to three months the majority of the Icelandic fleet of 200 motorboats, ranging in sizes between 40 and 200 tons, keeps up an intense pursuit of the large, fat and tasty herring.

To the Icelanders, the herring fisheries are a matter of supreme economic importance. The annual herring catch, of 200,000 to 300,000 tons, is more than twice that of the United States and Alaska combined. Next to cod fish it is the largest item in the country's export trade, and in a good year it may amount to 40 to 50 percent of the total, the rest being made up mainly of cod, haddock and numerous other fishery products. In 1944 the herring catch amounted to 221,000 tons, and the products, which at that time were mainly meal and oil, were sold mostly to the United States for about $7,000,000. Considering that the total population of Iceland numbers only about 130,000, the significance of this figure becomes apparent. Per ton, however, the dollar value for the herring export was abnormally low, because scarcity of barrels made salting impossible, but it is the highly priced salted product which has made the name of Iceland herring a favorite among the connoisseurs of salted and spiced fishery products.

During the war salting had to be practically stopped due to unavailability of barrels. In 1945 it was resumed with about 100,000 barrels, and in 1946 the Icelanders were hopeful of an expanding industry, with plans calling for about 300,000 to 400,000 barrels.

Herring Migrations

Although the herring (*Clupea harengus*) has long been one of the most significant fishery resources of the North Atlantic, relatively little is as yet known about its development and its migrations. The latest theory is set forth by the Icelandic fishery biologist Arni Fridriksson in his comprehensive treatise "Norourlandssildin" (The Herring of the North Coast of Iceland), 1944. According to this treatise, the real home of the race is the circular current between Norway, Greenland, Iceland, the Faroe

Islands and Jan Mayen. Spawning takes place along the Norwegian coast, and the young herring is stationary in Norwegian coastal waters until it is two to four years old. After the first spawnings, it probably enters into some more or less extensive circular migrations in the North Atlantic without reaching the coast of Iceland. When it grows older the circle expands, and then, after spawning, it migrates to the north about to the Lofoten region, to the west about Jan Mayen, and then to the south up to the north coast of Iceland. This is where it is caught in large numbers, and where it is found to be the finest raw material for the various delicacies for human consumption.

According to Fridriksson, the average state of the herring as it is caught off the north coast of Iceland is as follows:

Age 11.5 years, length 34.97 cm.; weight 385 gm.; number of vertebrae 57.048 to 57.005, body fat 18.2 percent. Late in July and in August the fat content usually rises above 20 percent.

Herring Fishing

The center for the Icelandic herring industry is the town of Siglufjordur. Its normal population is about 3000, but during the summer this is multiplied, as the town becomes the chief port for most of the Icelandic fleet of motorboats and numerous foreign vessels. It becomes the headquarters for numerous buyers and speculators, a temporary home for thousands of workers in the reduction plants and salteries and the actual center of Iceland's economic life. Here come the crews of Swedish, Norwegian, Danish, Faroese and many other vessels in pursuit of the herring. Everywhere there is work and ceaseless activity—if the herring runs—otherwise an expectant wait for the millions of dollars worth to begin pouring ashore.

Lately the Icelanders have commenced to modernize their fisheries. Every boat is equipped with a two-way radio and information about the schools of herring is freely passed between one boat and another. Government-operated planes maintain a continuous vigil along the entire north coast and far out to sea. They spot the approaching schools of fish, whenever they appear, and their information is immediately flashed by radio to the boats which can then set their course directly for their prey without wasting time and fuel in useless search. In the summer of 1945—the poorest herring season in history—there were two planes on the "herring patrol."

During the height of the season, most of the herring is caught in purse-seines, but toward autumn a large amount is also caught by driftnets. In 1946 the Icelandic government purchased an 80-ton purse-seiner in Tacoma, Wash., of the type used in the sardine fisheries of California. Instead of using the two ordinary purse boats, this type of vessel is equipped for pursing from the main boat itself which has among its equipment the pursing davit, purse winch, and turntable on the stern. It is hoped that in this way the number of fishermen required may be reduced one-half. It is of interest to note that the menhaden fishers on the East Coast of the United States have now borrowed this method from the Californians.

The Icelanders planned to purchase 50 motorboats, ranging from 55 to 80 tons, from Sweden in 1946 and several from Denmark. A considerable number of boats of similar size were under construction in Iceland itself. Altogether a substantial expansion is planned.

By far the greatest bulk of the herring catch goes to reduction plants. In Siglufjordur alone there are reduction plants with a daily capacity of about 5,000 tons, and during the height of the season the town is overhung with thick clouds of smoke from furnaces and driers, as all the factories are driven to their utmost capacity 24 hours of the day. Significant as this industry is from the economic point of view, it still cannot afford to pay nearly the price for the raw material that can be obtained in the case of the salted product. In the past the fishermen have obtained prices that were two to three times higher for herring delivered to the salteries rather than to the reduction plants.

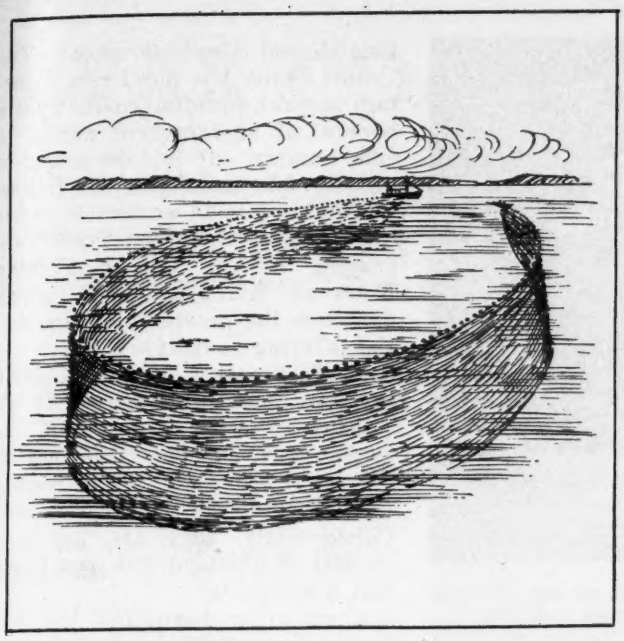
G. J. Sigurdsson, the author, spent a number of years in the United States investigating fish spoilage and processing.

Salting Herring

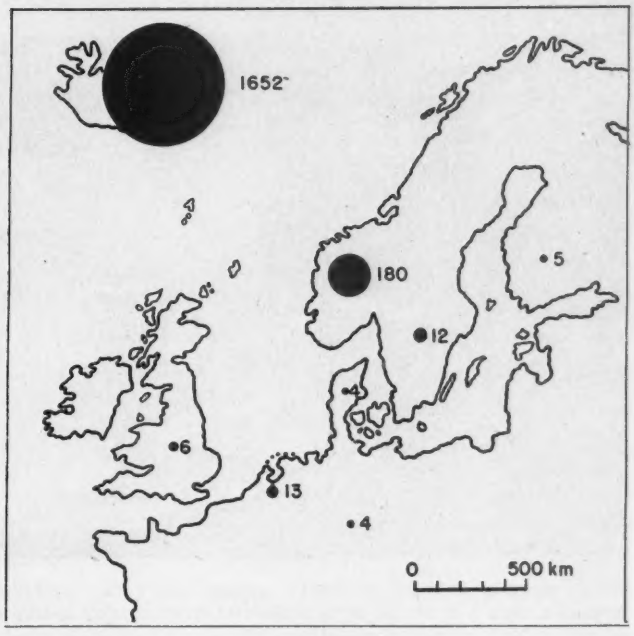
The salting of herring is an old and firmly established industry in Iceland. The age-old experience, meticulous care on behalf of the curers, and the unusual quality of the raw material have combined to build up a sound and unrivalled reputation for the salted article. No herring can be used for salting which is more than six to eight hours old, and careful inspection at the landing wharf makes sure that quality regulations are strictly enforced. Boats bring in the fish exclusively on deck. Deep piling is forbidden to avoid the possibility of bruises and softening of flesh. Herring is carefully landed by means of wicker baskets, and if they are not salted directly on the wharf, they are transported up to the salting station in shallow high-legged push trucks running on tracks. From the trucks the fish are transferred to oblong troughs, from which the salters remove them by hand, cut them according to the requirements of each particular cure, roll them in a salt bin, distribute the salt evenly all over the surfaces, and pack them in barrels with required amount of salt.

There is very little mechanization or use of labor-saving devices in salting herring at present. The same girl cuts the fish, rolls it in salt, and places it in barrels. Traditional equipment consists of a knife for cutting, a tub in which the cut herring is placed, and a shallow trough. The trough is divided in two by a partition, into one side of which is weighed the correct amount of salt for one barrel. The other side is used for rolling the herring in the salt, before it is placed in the barrel. When the barrel is full, and has a head of about two rows of fish, a man transfers it to a place where it stands, until the contents have sagged sufficiently to enable the cooper to fasten the top. It is then rolled to cold storage rooms and later carefully kept full by adding pickle periodically through the bung-hole.

Practically all the salting is done



The purse seine. The school of fish is surrounded by the net. Its lower edge is then drawn together with the purse string. The herring, if they have been entrapped successfully, are bailed onto the deck of the fishing boat alongside the seine.



The herring catch in 1937 for various countries in kilograms (2.2 lb. equals one kilogram) per capita. Iceland leads with 1642 kilograms per capita versus Norway's 180. The annual herring catch in Iceland amounts to 200,000 to 300,000 tons.

by women at open-air salting stations. Anywhere from 20 to 200 girls may be at work at a salting station. When there is a good herring run, the salters take turns to sleep. Frequently the working day is extended to 18 or 20 hours. There may be weeks, even during the height of the two months' season, when no herring is caught, and no one knows when the fish may decide to stop running.

Spiced and Cured Herring

Several kinds of cure are used to salt herring. The most common cure at present is the "cut" variety, where the fish is headed, and the entrails are removed by pulling them out of the body cavity. The amount of salt used for "cut" herring ranges from 53 to 62 lb. per barrel of 220 lb. of fish, depending on the buyer's wishes. This product is thus relatively hard salted and keeps well. Some of this plain salted herring is eaten without further treatment. A great deal is taken from barrels, filleted or cut in some way and packed as marinated herring in vinegar and spices.

Large quantities of "matjes" herring are also produced. This product is not as heavily salted as the "cut" herring. Greater care is required to prevent rancidity and softening of "matjes" herring during storage. Usually the "matjes" herring is cut with a special pair of scissors. A deep notch is cut vertically into the fish immediately behind the head, thus removing the gills and opening the body cavity. Tissue excised in this way pulls with it the intestines, as it is removed by the scissors. Barrels containing "matjes" herring must be kept at 28 to 30 deg. F. The greater care required to handle the "matjes" is paid for in the delicious flavor of the product.

Another product of considerable importance is spiced herring or "kryddsild" which is cured by carefully selected mixtures of spices. It is chiefly used for "gaffalbiter" and other hors d'oeuvre delicacies. "Kryddsild" may be cut in a variety of ways. The head may be removed and the intestines allowed to remain in the body. If the fish is very feedy, however, it must be eviscerated to insure fine quality.

The fish is removed from barrels after several months' cure, filleted, skinned and cleaned. Fillets can then be packed in tin cans with special sauces, such as "wine sauce," or cut into small pieces about one-half in. wide and packed in similar sauces. The latter is called "gaffalbitar." Spiced fillets in 5 lb. cans and "gaffalbitar" in 3¾ oz. cans, have been sold in the United States on a relatively small scale. Packing specialty products in tin cans and glass jars is, however, a relatively small operation in Iceland, but it is expected to increase materially. The principal difficulty in establishing a reliable export trade with these products is the necessity of storing them under refrigeration. Although the producer may deliver them in prime condition, wholesalers and retailers are often apt to mishandle them and treat them as sterilized canned foods, which invariably causes spoilage.

Rancidity causes the greatest amount of spoilages in salted herring. To prevent rancidity, barrels must be kept full of pickle at all times. Cool storage is required for the lighter salted varieties to prevent fermentation and other deteriorative changes.

By taking necessary precautions, spoilages become slight. In the future, however, use of antioxidants may provide greater safety and ease in handling. Experiments along these lines have already been made with promising results.

Exports

The Swedes probably know more about eating herring than any other nation. They import herring from Iceland in large quantities. It is a poor meal in Sweden that does not begin with some tasty herring tidbits and a hefty "snaps" of akvavit. It is said that a number of Swedes, when asked what they missed most during the war, placed the lack of Iceland herring at the very top of the list. Whether this tells more about the quality of the fish or the "hardships" suffered by the Swedes will be left for the reader to judge.

Among other importers of salted herring from Iceland are Finland,

When there is no work at salting stations, the young salters dress up and pay their friends a visit. It is all the more reason for crews to stay ashore on these occasions.

Salters remove herring from oblong troughs, cut off the heads, remove intestines, and place them in the tubs beside them. The herring are then rolled in salt, packed into barrels with the correct amount of salt, and the barrels are then coopered.

To avoid spoilage, the barrels of herring must be kept full by adding strong pickle periodically through the bung-hole. Salting is done in open-air salting-stations.

Poland and Czechoslovakia. The United States has purchased a certain amount, and the producers are hopeful of an increased export to this country. It is interesting to note in this connection the following statements in an article under the heading "American Trade" appearing in the British Fishing News on March 23, 1936, which discusses the prospects of the British herring industry:

"Unfortunately for the Scottish herring industry, America is interested in large sized West Coast classes only, such as large matjes, ... It is also fastidious in respect to quality, always wanting the best. Consequently, they are not purchasers of Shetland and East Coast salt herrings."

Then after discussing the Icelandic competition and the steps taken by the Icelanders to perfect their products and fulfill the conditions of quality the writer adds: "It (the Icelandic herring) is a large herring and extremely reasonable in price."

The summer of 1945 was probably the poorest herring season that Iceland has ever had. Week after week the fleet lay idle or scouted around without results. The factories were not operating and salting fell short of even the moderate mark set by the few barrels available. Heavy and serious losses were incurred by many of the boat owners, and the shares of the fishing crews were the lowest in many years. Incessant search went on, and all the inhabitants, laborers and entrepreneurs of Siglufjordur and the rest of the landing ports talked, speculated, and, above all, just waited, for the big run which never came. The season was largely a failure. But the experienced herring folk are not discouraged by such mishaps. Money can be quickly made and sometimes quickly lost in the Icelandic herring industry. Some people say that every tenth year is a failure; 1935 was bad also. Others admit that no one knows. Icelandic fishery scientists keep up their research on the biology of the fish, its migrations and their causes, and special interest is taken in the terrific quantities of plankton feed, on which the fish fattens during summer months. The picture is not clear, but on one point all are agreed—despite intermittent failures and intensive fishing, there is no evidence of depletion. Icelanders now optimistically prepare for a record season.

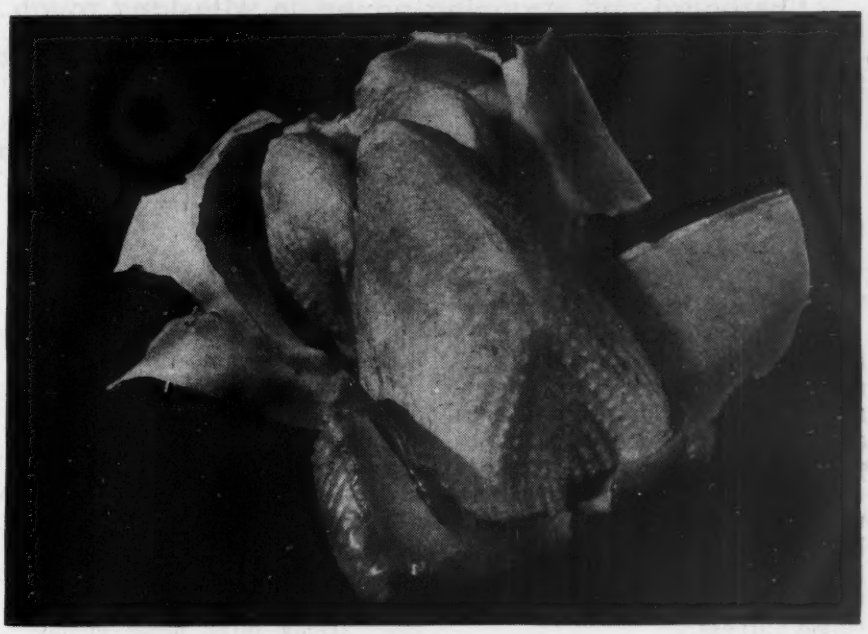
WAX COATING Frozen Foods

Thermoplastic waxes have new uses as a packaging material. Frozen foods are dip-coated with melted wax, which immediately hardens as a form-fitting and flexible wrapper. The coating does not stick to the food, but strips easily

A METHOD of dip coating frozen foods in a thermoplastic wax has been developed by M. E. Wallis, of Wallis Systems and the Utah Wax Refining Co., Salt Lake City. Known as the NoAir Wrap, it provides a form-fitting, perfect seal for frozen fish, meats, poultry, fruits and vegetables.

Frozen foods are dipped into a stainless steel tank containing the odorless, tasteless, liquid thermoplastic wax. The wax coats the foods, and it immediately hardens into a tough and flexible wrapper which withstands ordinary rough handling at low temperatures. It does not stick to food surfaces, but it does adhere closely to foods, eliminating air pockets. The dipping process covers foods completely, despite irregularities in shape.

While the coating is non-transparent, its form-fitting property enables the consumer to identify the product coated. Being moisture-proof, meats coated with the wax have been held one year without evidence of freezer burn or discoloration. The coating can be stripped quickly and completely from frozen foods. The seal is first broken with a knife, and the coating is stripped apart in large cast segments.



The thermoplastic wax coating, NoAir Wrap, strips easily from frozen, eviscerated turkeys in flexible pieces. The odorless and tasteless wax coating does not stick to the fowl.

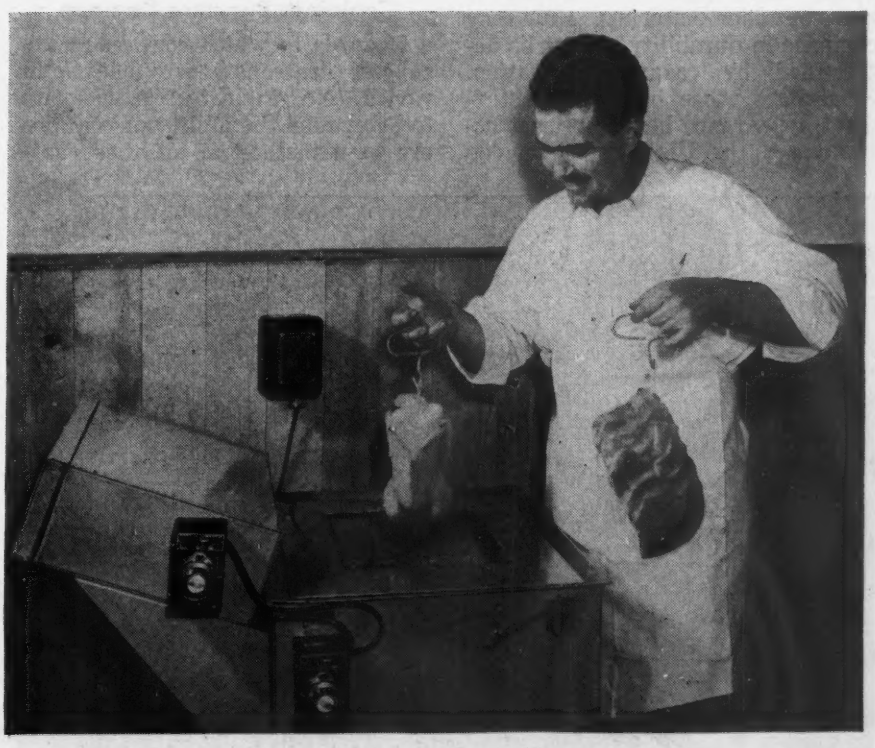
Coating Frozen Foods

Many procedures are used in applying the coating. The recommended method consists of first preparing the product for the customer. Meat is cut to size so that it is oven- or pan-ready. Poultry is dressed and eviscerated. Fish is filleted, steaked or dressed.

For hand dipping, a dipping cord with an identification tag is attached to the product. The tag has information on product identity, directions for thawing the product and removing the coating. Products are then arranged on aluminum or stainless steel trays and frozen.

A continuous quick freezer, de-

(*Continued on page* 204)



Hand dipping frozen poultry and meat in a tank containing thermoplastic wax. The wax immediately solidifies into a tough, flexible wrapper. The tank is automatically operated, and designed for locker plant use. Continuous dipping machines have been developed.

Container Strength Measured By a New Puncture Tester

Method developed to meet war needs successfully predicts the ability of fiberboard and wrapping papers to withstand rough handling and shipment. Tests indicate that the users will be able to obtain superior containers

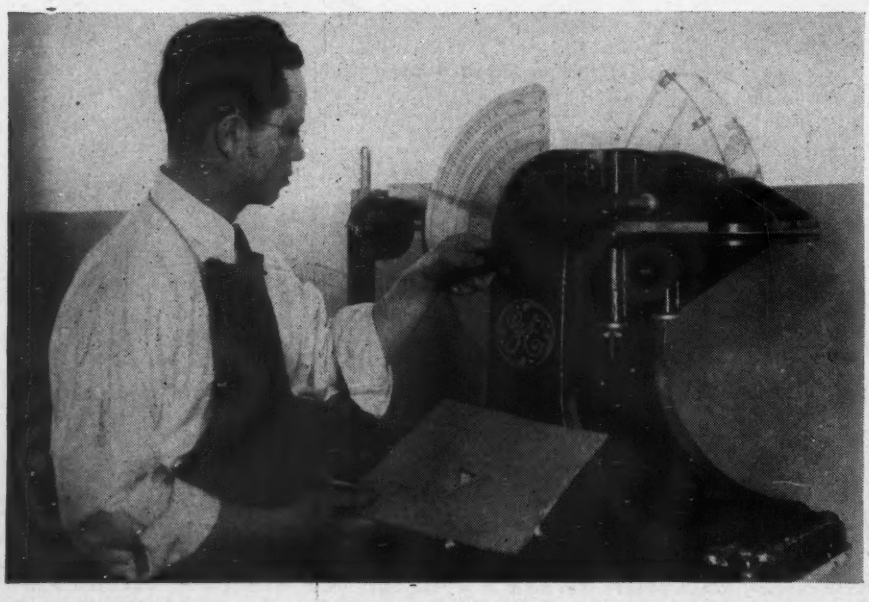
By C. J. FALK, General Engineering and Consulting Laboratory
General Electric Co., Schenectady, N. Y.

WITH the steadily increasing use of fiberboard containers for purposes for which other materials formerly were used, determination of the durability of such containers has become a major problem. This is especially true in the food industry, which is now using over 30 percent of all fiberboard containers manufactured in the United States—a larger proportion than is used for any other single purpose.

The problem of strength of containers has been accentuated by the recent development of numerous new container materials. How they compare in durability cannot be determined by casual observation. Sometimes those having the sturdiest appearance have the least actual strength. Users must rely on the manufacturers' statements that the fiberboard meets certain specifications, or have the materials tested by a commercial laboratory, or conduct tests themselves. The situation is complicated by the fact that the railroads are at present giving renewed study to specifications for shipping containers, which have always been a considerable problem for the carriers. For these reasons there is an increasing tendency among large users of fiberboard to adopt means of making their own durability tests.

Container Puncture Damage

Hazards to which containers are subject in transit are many and varied. No single test is adequate to determine the ability of containers to withstand all of these hazards successfully. From numerous studies that have been made, however, it is evident that damage by puncture is one of the greatest hazards. Several years ago a study made on large-scale shipments of canned foods indicated that the number of shipping containers seriously punctured in transit was in the neighborhood of 20 percent of the total shipped. While this figure does not necessarily represent the general average for all kinds of food shipments, examination of fiberboard containers at their ultimate destinations confirms the marked preponderance of punctures over other kinds of damage.



Use of the G-E puncture tester on various materials used in the fabrication of containers serves as an excellent guide to the probability of punctures during shipment.

Test Methods

Numerous methods of testing shipping containers were in use before the outbreak of World War II. Among them were the compression test, the impact test, the vibration test and the bursting test. While all of these methods can give valuable information concerning container strength, none has proved entirely satisfactory for measuring resistance to puncture—the great hazard of transit.

The method ordinarily used before the war to measure puncture resistance was the bursting test, wherein a small area of the material to be tested was subjected to a uniform hydraulic pressure which was increased steadily until the material was ruptured. This method, however, has serious drawbacks. Punctures are ordinarily caused by quick blows from sharp objects, as when the corner of a heavy wood crate is thrust against the side of a fiberboard container. This subjects the material to strains quite differ-

ent from those encountered when it is subjected to a uniform pressure over a sizable area.

During World War II, the United States found it necessary to ship an unprecedented volume of goods overseas in fiberboard containers. The thousands of items shipped in this way ranged from delicate instruments to huge quantities of foodstuffs. Because the durability of the shipping containers was of vital importance, the War Department undertook far-reaching studies of container materials. In this work, extensive use was made of a new type of puncture tester developed in the General Engineering Laboratory of the General Electric Company. As one result of its studies, the War Department was able to obtain containers far superior to those used in World War I.

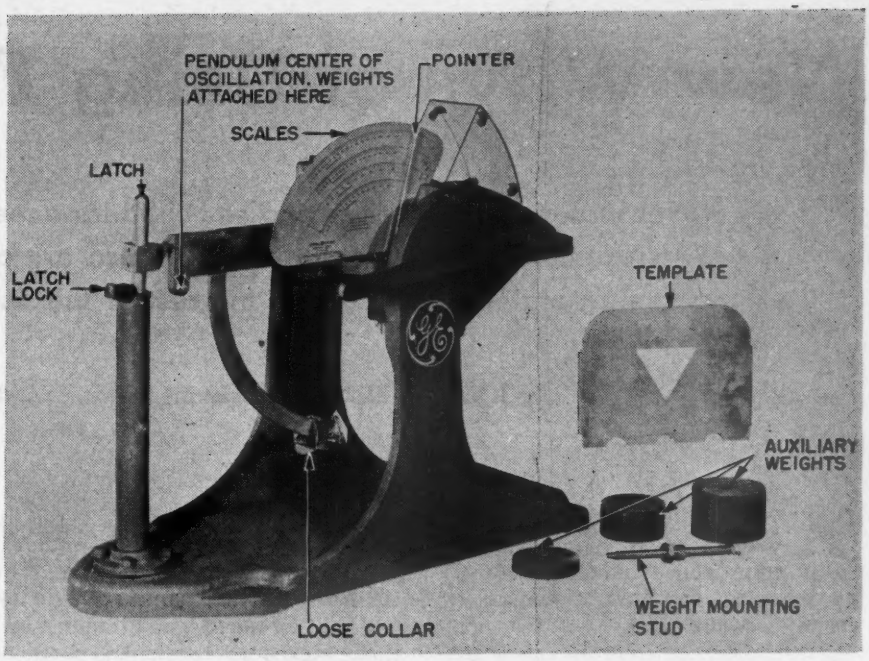
G-E Puncture Tester

The new puncture tester originated in the General Electric Company's need for better means of testing its own shipping containers for meters, instruments, motor appliances, lamps and similar products. Previous methods of testing had given results rather widely at variance with actual experience when the containers were used. It was felt that better results could be obtained by means of a machine striking a blow closely similar to that which the container was likely to receive in service.

In line with this idea an experimental puncture testing machine was developed by R. L. Beach, in charge of packing in the company's apparatus factories. Use of this apparatus on various kinds of material used in containers was found to give more information than any other kind of test on the material and the quality of its fabrication. Both of these factors are important. No method of fabrication can produce a strong box if the materials are of inferior quality. Similarly, the design of the corrugations and the adhesion influence the strength greatly, regardless of the materials used. The puncture tests measured both of these factors and were found to furnish an excellent guide to the liability of punctures in shipment. As an outcome of this experience, the use of the instrument became part of the company's standard testing procedure.

Widely Used

When the use of fiberboard containers skyrocketed as a result of the war, a widespread demand for puncture testers arose among fabricators, shippers and commercial testing laboratories throughout the country. Certain improvements were then made in design of the development sample and the instrument built on a production basis.



The puncture tester consists of a pendulum with a projecting arm which punctures the specimen, a pointer with appropriate scales for measuring the angle through which the pendulum swings, and a clamp for holding the test material in position.

The latest type puncture tester consists essentially of three parts. The first is a pendulum from which projects an arm in the form of a 90 degree arc. This arm carries on its free end a triangular, pyramidal point which punctures the specimen. Second is a pointer with appropriate scales for measuring the angle through which the pendulum swings. Third is a clamp for holding the specimen in position. All of these elements are assembled on an iron frame.

After the pendulum has been raised to a horizontal position it possesses a definite amount of potential energy. When a latch is released the pendulum will swing through its arc 90 degrees past the vertical, or approximately 180 degrees total. If there is a sample between the plates, its rupture by the puncture point will absorb some of the energy of the swinging pendulum. Hence, it will not swing the full 90 degrees past the vertical, and the number of degrees by which it fails to swing through its full arc is an accurate measure of the energy required to puncture the material being tested.

A lightly-held, detachable collar fits around the base of the puncture point. The function of this collar is to hold open the three triangular flaps which will be torn in the sample being tested. Thus the flaps will not rub against the puncture arm and cause frictional error during its swing after the material is ruptured.

Testing Heavy Materials

The potential energy possessed by the bare pendulum when in the horizontal position is not sufficient to enable it to puncture heavy materials. It is therefore necessary to increase the energy of the pendulum by adding weights when heavier grades of materials are being tested. These weights are added at the point on the pendulum at which they will increase the energy of the pendulum without increasing its velocity. Different scales are provided for reading the pointer when different auxiliary weights are used. Readings are in "puncture test units," this nomenclature having been found simpler and easier than "inch-ounces per inch of tear."

Testing Thin Materials

For measurement of thin material a modified test is used. Because the puncture tester was designed for measuring a wide range of corrugated and solid fiberboard, the regular numerical scale is too condensed to permit accurate readings on extremely light material. To facilitate the testing of wrapping paper and materials of that nature, an auxiliary scale is provided and the

(*Continued on page* 206)

New Ways of Using Food Wraps

Novel materials for curing rindless cheddar cheeses and new technics for wrapping print butter and sliced bread are among applications of wrapping materials of current interest in the field of food packaging

By JOHN V. ZIEMBA, Assistant Editor, "Food Industries"

A NEW butter wrapper, consisting of thin gage, coated aluminum foil mounted to 15 lb. parchment, has been found to extend the shelf-life of fresh print butter twice as long as other protective wrappers. The new wrapper is attractive, reduces score and weight losses, and protects the butter against contaminating odors from foods such as fish, onions, garlic, and cheese. A low cost, light weight box has been designed for curing rindless cheddar cheese in Pliofilm. It facilitates the removal of the cheeses after curing. The curd is first packed in a Pliofilm bag or wrapped in Pliofilm, and then packed in the new box. Stale bread waste is reduced by the development of the Twin-Pack loaf. Bread is sliced, separated into halves. Each half is wrapped, and both halves are then overwrapped. These three applications are discussed in detail in this article.

Laminated Foil Butter Wrap

New wrap keeps butter fresh twice as long, reduces score and weight losses, and protects against other food odors

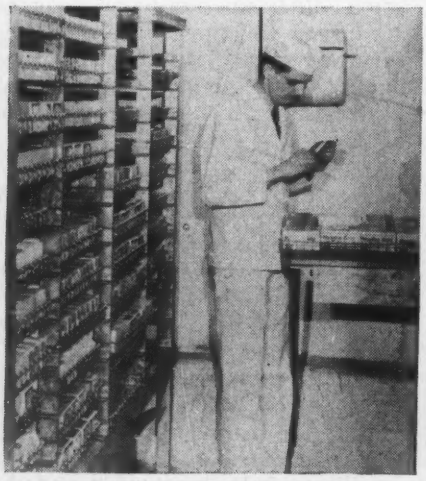
TESTS made by G. W. Shadwick, director of quality control and research for Beatrice Foods Co., have resulted in the adoption of a laminated foil wrap that gives butter better protection. Many types of packaging materials were evaluated to determine which minimized score, flavor, color, and weight changes during marketing.

During shipment and handling through normal trade channels, butter loses its score and flavor. Flavors are also absorbed when in contact with other products. Oxidation of butterfat takes place upon exposure to light, resulting in off-flavors and discoloration. Weight losses also occur during storage.

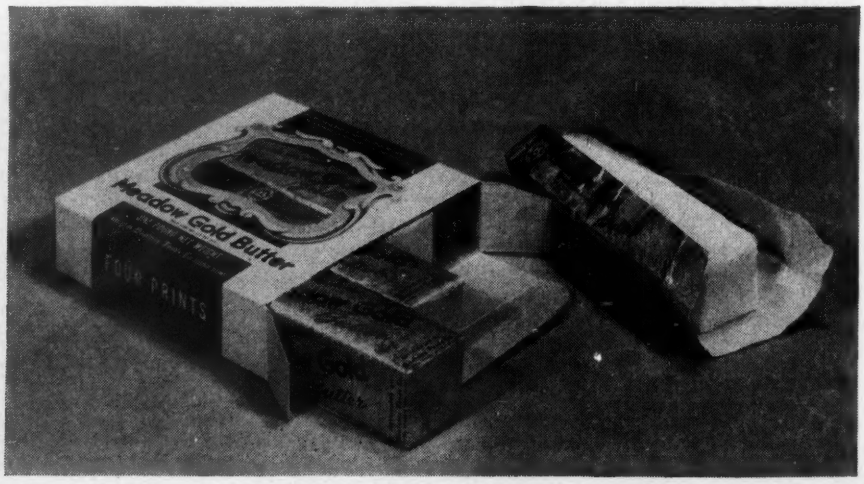
In addition to product protection, other requirements were investigated. The new wrap had to be reuseable, so that partially used butter could be rewrapped without losing its quality. The wrap had to be adaptable to existing packaging machines to avoid delays in new equipment design. It also had to have eye-appeal.

Various types of plastics, parchments, waxed papers, and laminated materials were evaluated. Foils of various weights and thicknesses and foils laminated to a variety of materials were also tested. Identical butters were used in each set of tests, with the conventional wrap as the control.

Samples were held: (1) Ten days to six months in cold storage at —15 deg. F., (2) four to 16 days at 70 deg. F. with a relative humidity of 80 to 90 percent, and (3) 14 days in a household refrigerator at 40 to 45 deg. F. Packages were also sealed in shipping containers in contact with fish, onions, garlic, cheese, and various leftover dishes for three



Accelerated changes are studied by storing butter at high humidity-temperatures.



The Beatrice Foods Co. has adopted laminated foil wrap for its Meadow Gold butter. The new wrap is made up with thin gage aluminum foil laminated to parchment.

to seven days. During the tests, samples were checked for losses in score, weight losses, butterfat oxidation, and absorbed flavors.

Many materials were eliminated as the tests progressed. Some wrappers imparted objectionable flavors to the butter, particularly certain plastic materials. Aluminum foil showed considerable promise. In the case of aluminum, additional research was conducted by Reynolds Metals Co., which resulted in the foil wrap now being used. Annealing studies were made to determine the correct tempering to adapt the foil to machine wrapping. Some foils wrapped well, but at —15 deg. F. storage they broke and split open. Foils that were too soft could not be handled satisfactorily in wrapping machines. To eliminate corrosion of aluminum by salt, a suitable coating was applied to the foil.

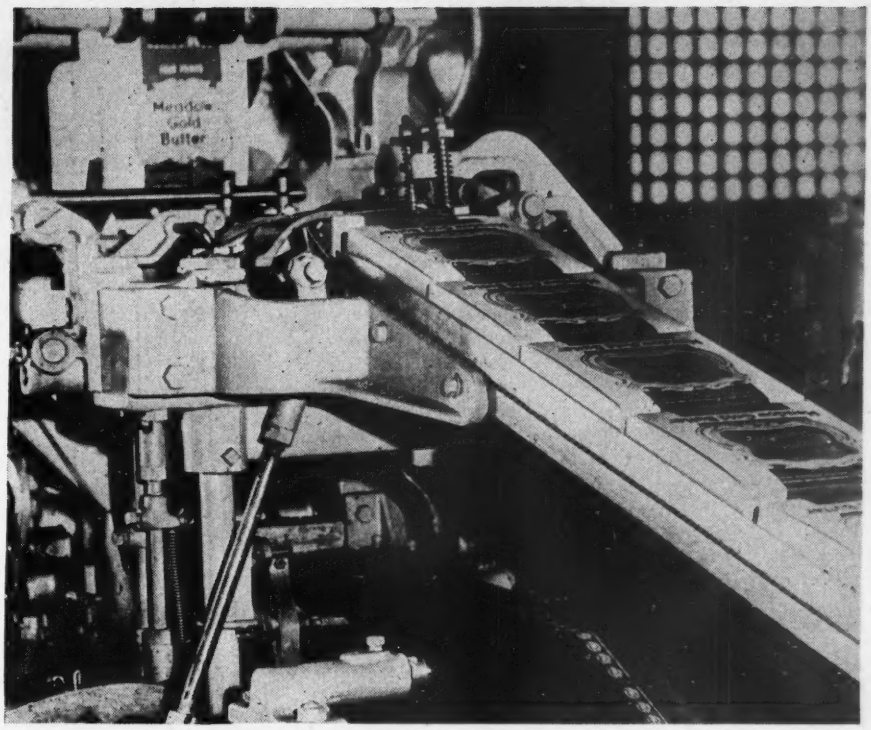
Foil alone, and foil laminated to other materials, provided similar product protection. Without a laminated backing, however, foil tore easily, making it difficult to strip it from the butter.

Foil laminated to parchment was most promising. Conventional parchment, however, made the laminated wrapper too heavy. Consequently, it could not be adapted to machine wrapping. The Paterson Parchment Paper Co. developed a light, 15 lb. parchment which, when laminated to foil, could be handled by the wrapping machine.

The new Meadow Gold butter wrapper consists of an 0.00045 gage, coated aluminum foil, mounted to 15 lb. parchment. It is color printed. The foil wrapped butter is packed in an open face carton.

Summary

1. The control wrapped butter lost an average of two points more in score than foil wrapped butter.
2. The new aluminum foil wrap protects butter against the absorption of other food flavors.
3. Weight losses were 2¼ percent greater in control samples than in foil wrapped butter.
4. Fat oxidation was reduced by the use of a foil wrapper.
5. The wrap can be used to rewrap partially used butter without losing its original protection.
6. The foil package is attractive.
7. The foil wrap is adaptable to existing wrapping machines, with minor changes in the equipment necessary. It does a neater wrapping job than the control wrapper.



A standard packaging machine is used to wrap butter. Laminated foil is fed from a roll, cut to size, wrapped around ¼ lb. prints, and then packed into open face cartons.

Box for Pliofilm-Cured Cheese

Specially designed, telescopic box facilitates the removal of natural, rindless cheddar cheese cured in Pliofilm bags

A LIGHT weight, telescopic box which facilitates removal of contents has been designed for the no-rind curing of natural cheddar cheeses in Pliofilm. The box is built of thin gage, low cost, fiber material. A new, attractive closure permits careful handling of the cheese from the pressed curd stage to final removal of the cured product. Re-use can be made of the box without danger of faulty cure or improper handling in subsequent cures.

Construction

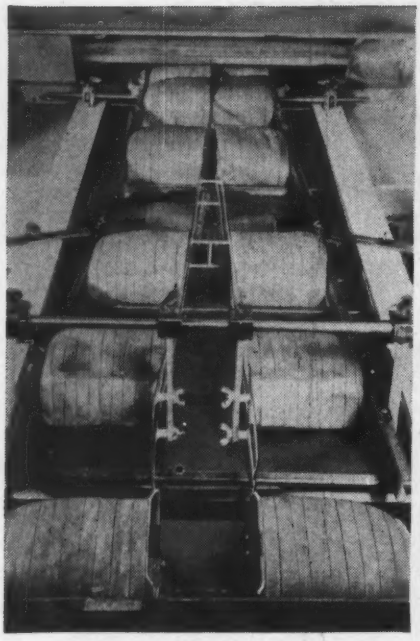
Top and bottom tubes of the box are wound from waterproof chipboard. Ends are constructed of two ply wood veneer strippings closed with wooden end plates 7/16 in. thick. Nails are driven through the stripping and chipboard wall.

A specially designed strip along the vertical length of the bottom tube facilitates removal of cured cheese. The cured cheese is removed by taking off the top tube. The lower tube is then distorted with outward pressure along the edges of the slit. This permits a free flow of air around and beneath the Pliofilm bag containing the cheese. The box regains its original round form, and it is not destroyed when the cheese is removed.

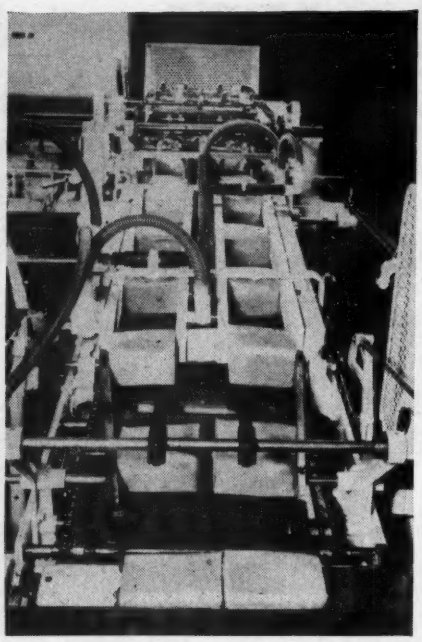
Packing Curd in Box

Special re-usable hoops and wrappings are used in the pressing operation. Other types of pressure containers are readily adaptable.

After the hoops and wrappings are removed from the pressed curd, it is packed in a prefabricated bag or wrapped in film. The bag and wrapper are constructed of 40 gage N1 Pliofilm. Ends of the bag or wrapper are folded over the top of the curd, but not sealed. Gases generated from the curd during aging escape through the folds. Pressure applied through the top of the box prevents entrance of air and subsequent mold growth. The curd is then cured to the age desired, at 40 to 50 deg. F., to produce a rindless, natural cheddar cheese.



After loaves are sliced, they are separated into halves by the slicer separating device.



Two wrapped half-loaves pass to material feed of second AMF bread wrapper.

Wrapping Half-Loaves

Stale bread waste is reduced by wrapping sliced, half-loaves. The halves are then recombined and overwrapped

THE problem of reducing stale bread waste has been solved by the development of the Twin-Pack loaf. Besides reducing "stale," the method enables two varieties of bread to be packaged in the same loaf.

The Twin-Pack is a regular loaf that has been sliced and then divided in two. The two halves are wrapped separately, then recombined and wrapped together. The special bread wrapping machine is being manufactured by American Machine and Foundry Co.

To facilitate opening the twin package, the overwrap can be equipped with a cellophane tear strip under the center of the sheet. By pulling the tear strip, the two half-loaves are separated. One is opened for immediate use, while the other is kept fresh in its sealed wrapper for later use.

Twin-Pack Operation

The loaf is first sliced in a bread slicer. A loaf separating device separates the sliced loaf into halves. Guides deliver these half-loaves into the material feed chains of the first AMF wrapping machine, which wraps the half-loaves simultaneously. The individually wrapped half-loaves are then transferred to the second AMF standard wrapping machine by means of a timed feed conveyor. The two wrapped halves are then recombined and wrapped together in the final outer wrapper.

Variety of Wraps

Twin-Pack loaves can be wrapped in a variety of wraps. Individual half-loaves, as well as the complete loaf, can be wrapped in either waxed papers or transparent films. A variety of Twin-Pack wraps with waxed paper and cellophane or glassine combinations are possible. For example, one half-loaf can be wrapped in printed waxed paper for identifying the loaf, while the other half can be wrapped in a transparent material. The complete loaf can then be wrapped in glassine, cellophane, or any other suitable transparent wrapper.

Loaves varying from 10-12 in. can be wrapped as Twin-Pack loaves. Other sizes can also be wrapped, but at extra cost.

The Twin-Pack was designed by J. Hexter, president of Columbia Baking Co., Atlanta, in 1939. Two years after adopting it, sales of Twin-Pack bread increased 54 percent. Wartime restrictions against double wrapping prevented the production of Twin-Pack bread during the war.

Recently Columbia Baking Co. re-introduced the Twin-Pack for its own bread. The company plans to make it national through licenses to wholesale bakers. Licensing will be handled by Bakers Research Bureau, New York City.

A baker must wrap 40 percent of his bread in Twin-Pack to hold his franchise. Royalties are paid on every loaf. In return the baker receives advertising and promotional material.

Twin-Pack loaf going through polar seal and pick-off table of second wrapper.

By pulling the tear strip, the housewife has two individually wrapped half-loaves.

Commonsense About Evaporation

Proportions of a steam kettle are as important as its size. New form is a trough-shaped continuous evaporator. With a vacuum evaporator, overheating of the product may occur despite a low vapor temperature

By L. V. BURTON, Editor of "Food Industries"

RECENT inquiries about steam jacket kettles, their proper size, steam pressure, amounts of steam needed and the alleged economy of single-effect vacuum evaporation reveal that a considerable misunderstanding still exists about methods of cooking or evaporation. There is no mystery about evaporators to men who have been trained in mechanical or chemical engineering, but not all food technologists have received this training.

A steam jacket kettle is merely a specialized form of heat transfer apparatus. Steam supplies the heat by condensing on the inner bowl of the kettle. In order for the heat to flow into the bowl and thence to the liquid in the kettle there must exist a thermal gradient. The temperature of saturated steam in the jacket must be from 15 to 70 degrees hotter than the boiling liquid. This means that it must be under a pressure in the jacket of from about 5 to 36 psi.

In theory, every pound of liquid evaporated requires at least a pound of saturated steam to be condensed. In practice it is necessary to allow about 15 percent extra to compensate for radiation losses. Hence, for every pound of water to be evaporated from an open kettle about 1.2 lb. of saturated steam at a pressure of from 5 to 36 lb. psi. will be needed. High speed evaporation requires high jacket pressures and the kettle must be well made, not a cheap one. The kettle should have as few seams as possible. If cooking rather than evaporation is the function, the amount of steam needed is far less.

One factor in the rate of heat transfer is the character of the metal used in fabricating the inner bowl. High heat conductivity requires a lesser heat gradient than low conductivity. Hence, lower jacket pressures are possible for metals of high conductivity.

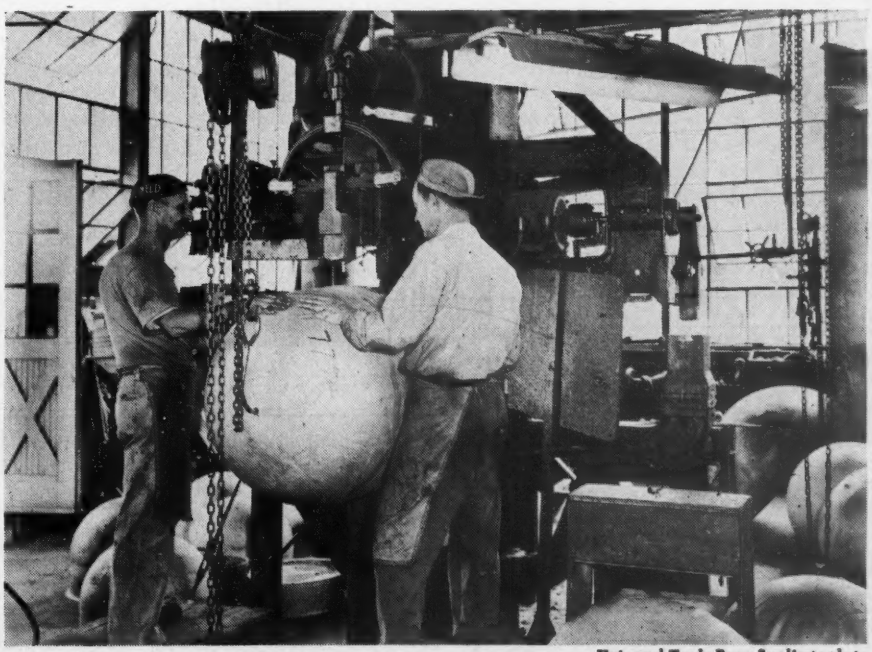
How large should a kettle be? Assuming that the objective is evaporation, the answer is determined by how much liquid is to be evaporated per hour. With a good kettle, properly installed, it is possible to evaporate up to 35 lb. per square foot of heating surface per hour. In general, that figure determines how big your kettle should be, except that kettles are seldom made larger than 500 gal. capacity. The structural problems of big kettles make it expedient to use smaller sizes.

Installation

Proper installation of a kettle involves use of adequate steam lines, for it is B.t.u. that does the work, not pressure—lb. of steam, not lb. per square inch (psi.). Also needed are safety valves, adequate venting of air in the jacket and drainage of the condensate, and properly functioning steam traps of adequate size to let the condensed water out of the jacket while keeping back the steam. There are also certain fine points, like proper expansion joints or other provision for expansion of steam pipes so that the kettle stands on its own legs, not on the steam pipe, when it is hot.

The shape of the kettle—high or low collar—depends on the character of the liquid to be boiled. Where a liquid foams markedly, it is necessary to have a high collar to keep it from boiling over.

Kettles for holding a liquid hot, rather than boiling it, are sometimes made with a very low jacket and a collar several times the depth of the bowl. But such kettles have a very limited use and cannot serve any other purpose efficiently. Furthermore, the use of steam to heat a holding kettle is not as satisfactory as hot water or other heating medium at a controlled temperature. This is particularly true where any boiling in this operation is like-



Universal Trade Press Syndicate photo

Hammering—one operation in kettle making.

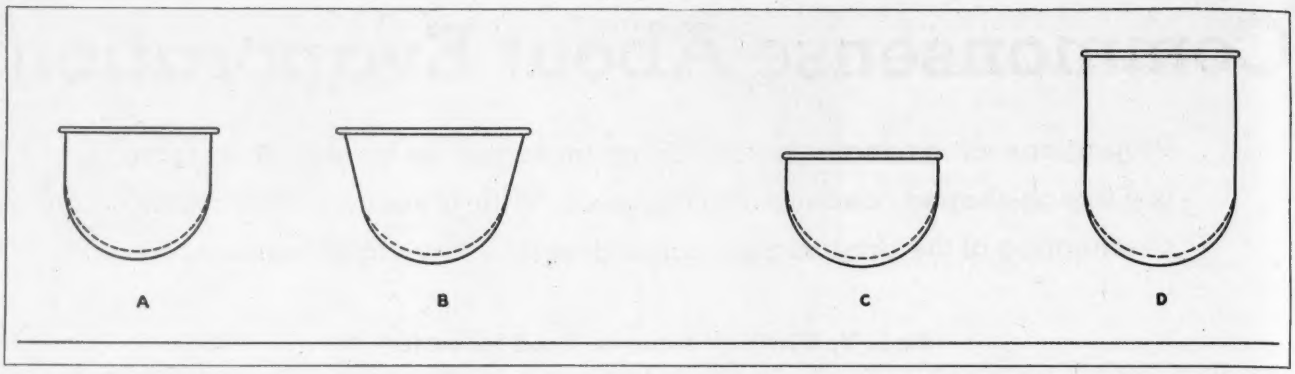


Fig. 1. Types of steam jacket kettles. A. Ordinary. B. Flaring Top. C. Short Collar. (Boils over easily.) D. With high collar, and consequently small ratio of heating surface to volume, is better for cooking than for evaporation.

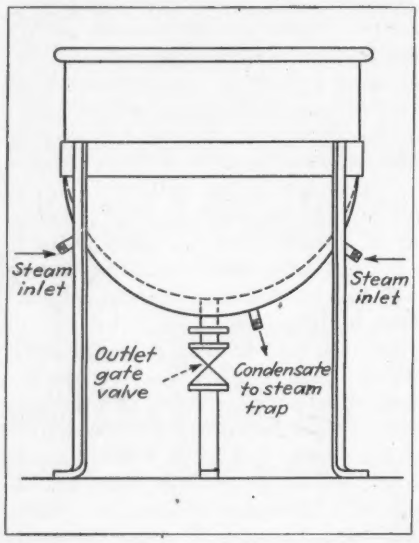


Fig. 2. Conventional steam jacket kettle on a stand. For every pound of water evaporated about 1.2 lb. of steam must be condensed in the jacket. Steam valves, safety valve, and steam trap omitted.

ly to change the composition of a batch. Catchup is such a product.

Something that might be termed a continuous kettle is at present undergoing development. (See Fig. 3.) It is a kettle that instead of having a hemispherical shape is built as a jacketed trough through which the liquid flows, boiling as it goes. This design is merely a rather unusual form of a continuous evaporator operating at atmospheric pressure.

Kettles in Line

When the production of a food item requires the operation of several kettles in sequence it is important, from the viewpoint of efficient production and good quality control, that all be as nearly alike as possible. This is important if production delays are to be avoided by a slow kettle in the line, or if overcooking of a product is to be avoided by holding back a fast kettle. It may be economical in first cost to use whatever kettles or sizes may be on hand when increasing production. This economy, however, may be lost in higher operating costs when large and small kettles, or fast and slow ones, are used in the same line operation.

Lastly is the matter of single-stage vacuum evaporation which so many erroneously believe is economical of heat. Multistage vacuum evaporation, where the vapor from one stage heats the liquid in the next stage, does effect a real heat economy. But, in a single stage evaporator, no such economy is possible, the reason being that at reduced pressure more B.t.u. are required to evaporate a pound of water than at atmospheric or higher pressures. (If in doubt, consult the steam tables.) Furthermore, there is the additional cost of op-

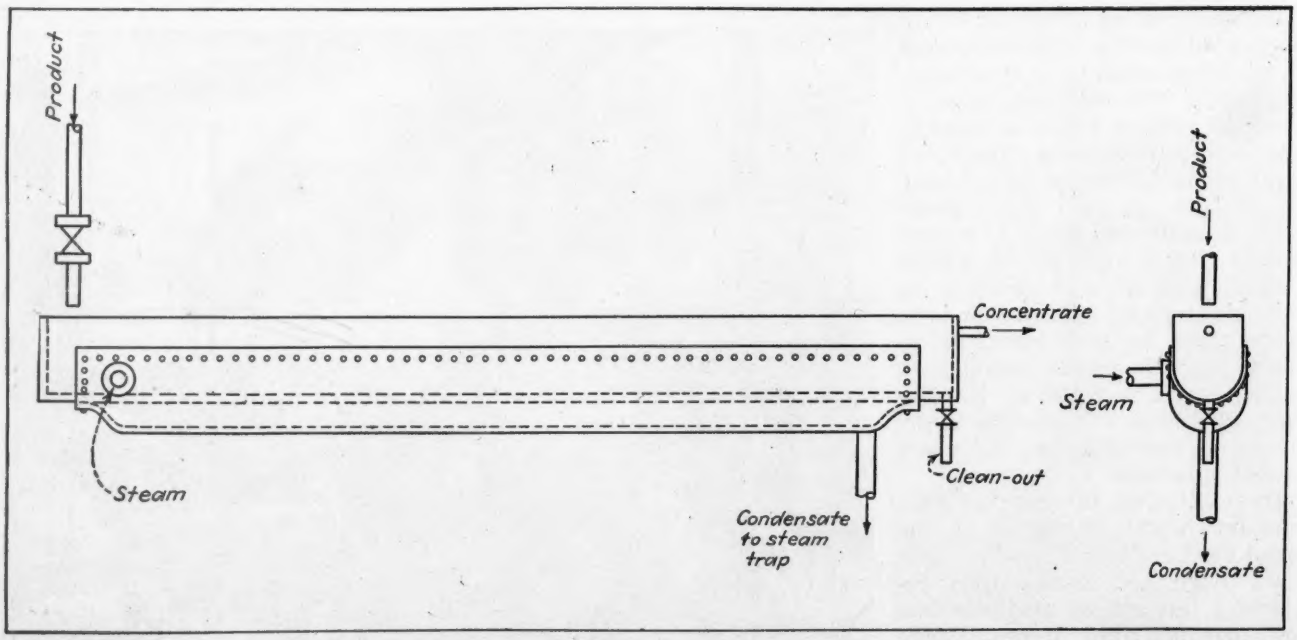
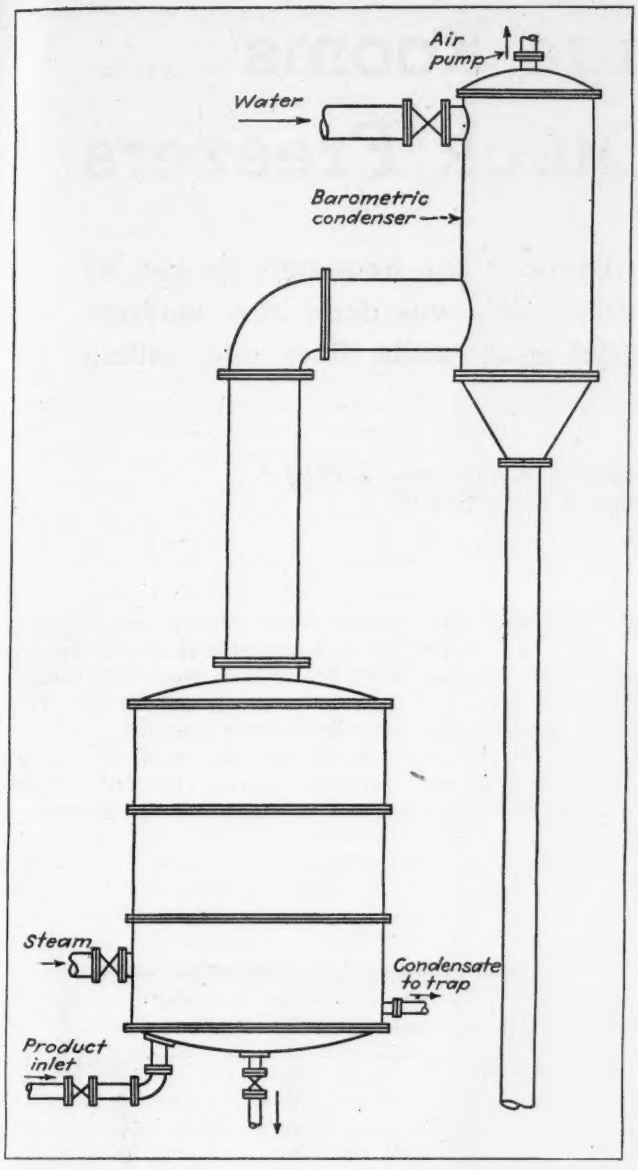


Fig. 3. Continuous evaporation or cooking at atmospheric pressure is possible in this type of kettle that is really a steam jacketed trough. Where needlessly high jacket pressures are specified, staybolts may be required, adding unnecessarily to the cost.



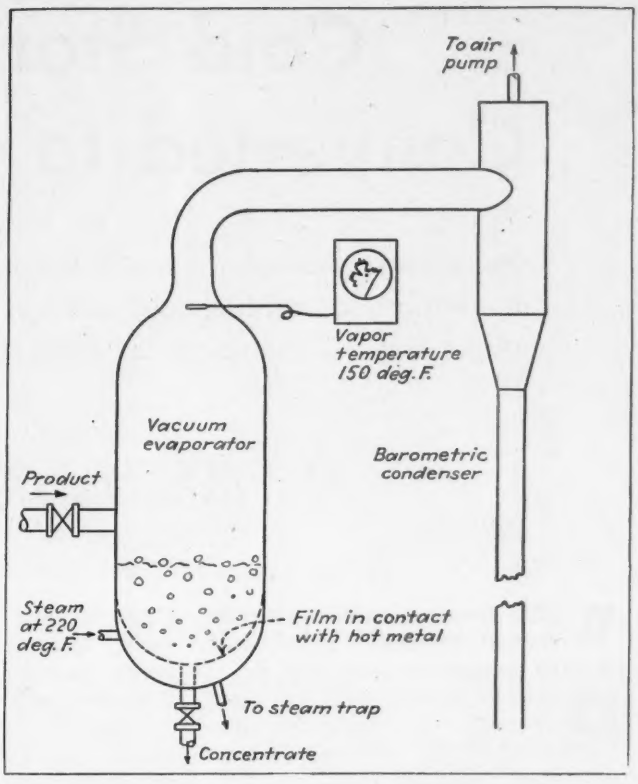


Fig. 4. (Above) There is an erroneous belief that temperature of escaping vapor is the same as that of the heating surface. The liquid film in contact with the hot surface is momentarily almost as hot as the steam in the jacket. This may injure the flavor of a heat sensitive product.

Fig. 5. (Left) Single effect vacuum evaporator—the conventional piece of equipment to lower the temperature of boiling. It is not used to effect heat economy.

erating condensers, water pumps and vacuum pumps. What then is the advantage of a vacuum evaporator?

It has a decided advantage, though not in the form of heat economy. The real reason for single stage vacuum evaporation is to reduce the temperature of the boiling liquid to a point below its boiling point under atmospheric pressure. Lowered boiling temperatures are important for a class of substances known as "heat sensitive." Milk is a common heat sensitive material. Others are sucrose, citrus juices, preserves, meat extract.

Overheating

Vacuum evaporation, though useful to lower the boiling point, is not well understood by all food technologists, and sometimes a heat sensitive liquid can be overheated, even at reduced temperatures. "Temperature of evaporation" is usually the reading of a thermometer in the vapor uptake. If it reads, say 150 deg. F., the assumption is usually made that the liquid is not subjected to a higher temperature. As a matter of fact, however, the temperature of the heating surfaces must be considerably higher than the escaping vapor temperature. If this were not true, there would be no thermal gradient, and no heat transfer could take place, hence no evaporation. Therefore, there must be moments when the heat sensitive liquid is exposed in a thin film to higher temperatures. In milk evaporation it is possible to have temperatures of 220 deg. F. at the heating surfaces when the vapor temperature is only 150 deg. F. This may or may not be the true cause of the cooked flavor of evaporated milk or spray dried milk but is cited to suggest that the mode of heating vacuum evaporators should be a fruitful field of investigation for flavor improvement or control.

The steam jacket kettle is a useful piece of heat transfer equipment in the food plant. The single-stage vacuum evaporator, its close relative, is useful to control evaporating temperature.

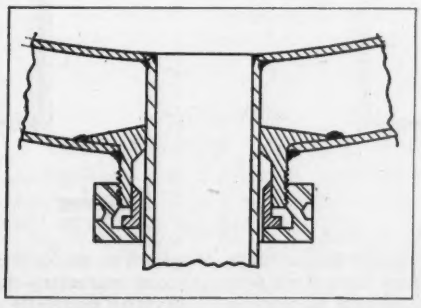


Fig. 6. Some kettle builders put expansion joints on outlets to eliminate repeated flexing of stiff materials of construction.

Cold Storage Rooms Converted to Quick Freezers

Increased demand for quick freezing capacity can frequently be met by converting available cold storage rooms. This was done at a southern plant by the addition of extra insulation to walls, floor and ceiling

By JOHN F. STONE, Staff Manager, Refrigeration Section
The Johns-Manville Company, New York, N. Y.

WITH the expansion of the quick freeze business, many cold storage companies are finding it desirable to convert part or all of their capacity to quick freezing. Such a conversion has recently been completed at the plant of Gulf Frosted Foods, a division of the Gulf Ice and Coal Storage Company, Evergreen, Ala., the work being done by Gulf States Insulation Company of Mobile, Ala.

Gulf Frosted Foods handles any commodity which lends itself to quick freezing, with emphasis on sea foods, summer fruits and vegetable packs. Important items are shrimp and strawberries. In addition to its own food, the company is also engaged in contract freezing and public freezing.

So great has been the demand for this service that the company found it necessary to expand its

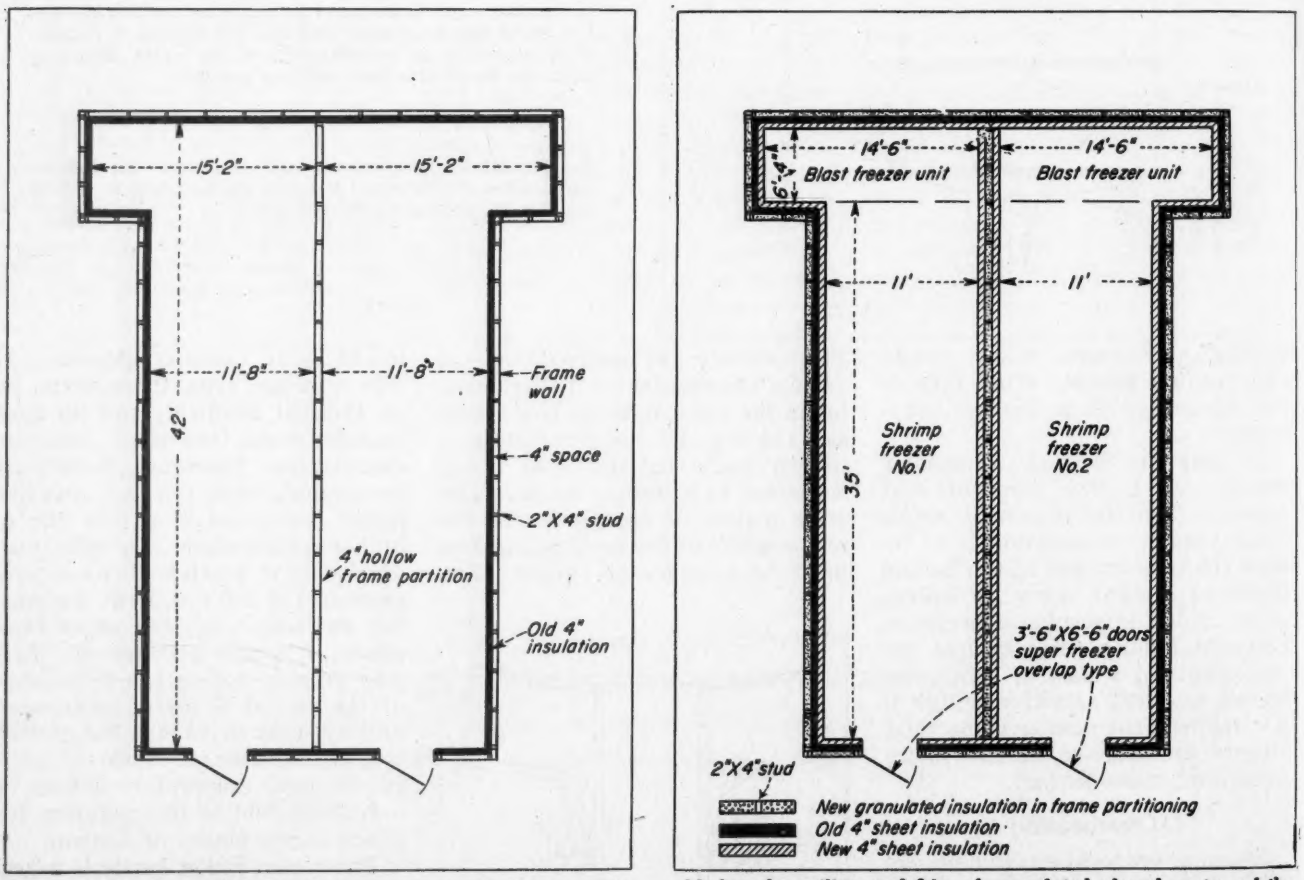


Fig. 1. Converting cold storage rooms to quick freeze units. (Left): Original cold storage rooms—4-in. of sheet Rock Cork were used in the walls and floor, 2-in. in ceiling. (Right): In the converted rooms 4-in. of sheet insulation were added to the walls and 4-in. of granulated were filled in the spaces between the original insulation and the outside walls. 4-in. of sheet Rock Cork were added to the ceiling and 6-in. of granulated placed on top of the wood sheathing that supported the original insulation. Center partition originally consisted of boards nailed to 2x4 studding. The space between the boards was filled with granulated insulation and a 4-in. layer of sheet insulation was placed on each side. Two blast freezers produce temperatures as low as minus 50 deg. F.

quick freezing capacity by converting two of its cold storage rooms to shrimp freezing units. The rooms are in a small frame building immediately adjacent to the main plant. Frick Blast Freezers, which produce temperatures down to minus 50 deg. F., were installed in the converted rooms.

Factors to Consider

An important factor in converting the two rooms from cold storage to quick freeze was the choice of the proper type and amount of insulating material. Naturally, efficiency and economy depend upon keeping the refrigeration load down, thus conserving power.

Other important factors are durability of the insulating material, since insulation failure may have disastrous results; resistance to effects of moisture or air infiltration, the most frequent causes of insulation failure; chemical inertness; and, where food products are to be stored, resistance to odors.

The rooms converted to quick freezing had previously been insulated with sheets made of a combination of rock (or mineral) wool with an anhydrous binder.* Four inches of this insulating sheeting on the walls and floor, and two inches on the ceiling had been sufficient to maintain efficient operation at cold storage temperatures (30 to 40 deg. F.). Covered with a coat of aluminum paint, the original insulation was still in excellent condition at the time of conversion.

Insulation Added

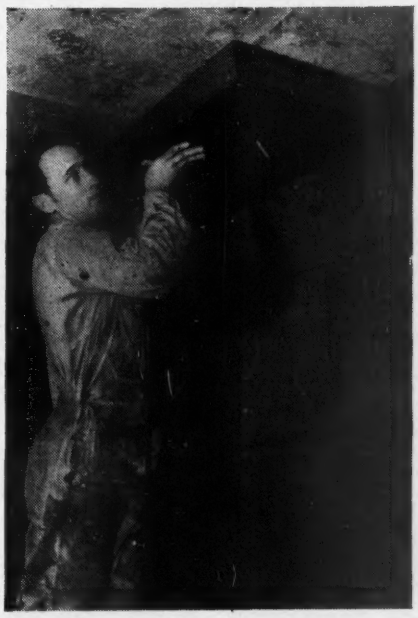
To maintain a quick freeze storage compartment at minus 50 deg. F., which was desired in this case, at least ten inches of insulation should be used. For maximum economy, however, twelve inches of Rock Cork were employed. To the insulation already present, therefore, additional insulation was applied, as follows:

Walls: Four inches of insulation sheeting, plus four inches of granulated insulating material (made of the same mixture as the sheeting) filled in the space between the frame wall and the original sheet insulation.

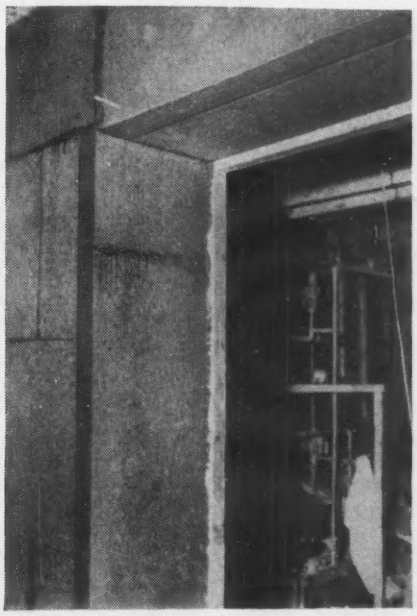
Ceiling: Four inches of insulating sheet, plus six inches of granulated insulating material.

*Rock Cork, a product of Johns-Manville.

In converting the cold storage rooms to quick freeze units, sheets of insulation were applied to walls and ceiling. Insulation in floor was covered with concrete.



Workman applying a 4-in. slab of Rock Cork to the 2-in. thickness used in the ceiling of the cold storage room.



When building a room for quick freezing it is important to have the insulating material fit close around all openings.

Floor: Eight inches of insulating sheeting, plus three inches of concrete wearing floor.

Center Partition: Four inches of insulating sheeting on each side, and four inches of granulated insulating material between studs.

Application

The insulating sheeting was added in the form of four-inch thick blocks. For a protective coating over the walls and ceiling, a plastic, Insulkote, which stands up under temperature extremes and remains sufficiently elastic to prevent cracking, was applied. Aluminum paint was applied to increase the resistance to moisture penetration and to reflect light.

After conversion, each room measured 11 ft. wide by 35 ft. long by 8 ft. 2 in. high. The blast freezer units, (see Fig. 1) are located at the rear of each room in recessed spaces measuring 14 ft. 6 in. by 6 ft. 4 in. by 9 ft. 7 in. in height, the floor being dropped 17 in. to accommodate the equipment.

The insulation job took three weeks and consumed 18,500 feet of new insulating sheeting plus 1,650 cu. ft. of granulated insulation, in addition to the 11,000 board feet of material previously used to insulate the cold storage rooms.

Plastic Used for Brine Tanks

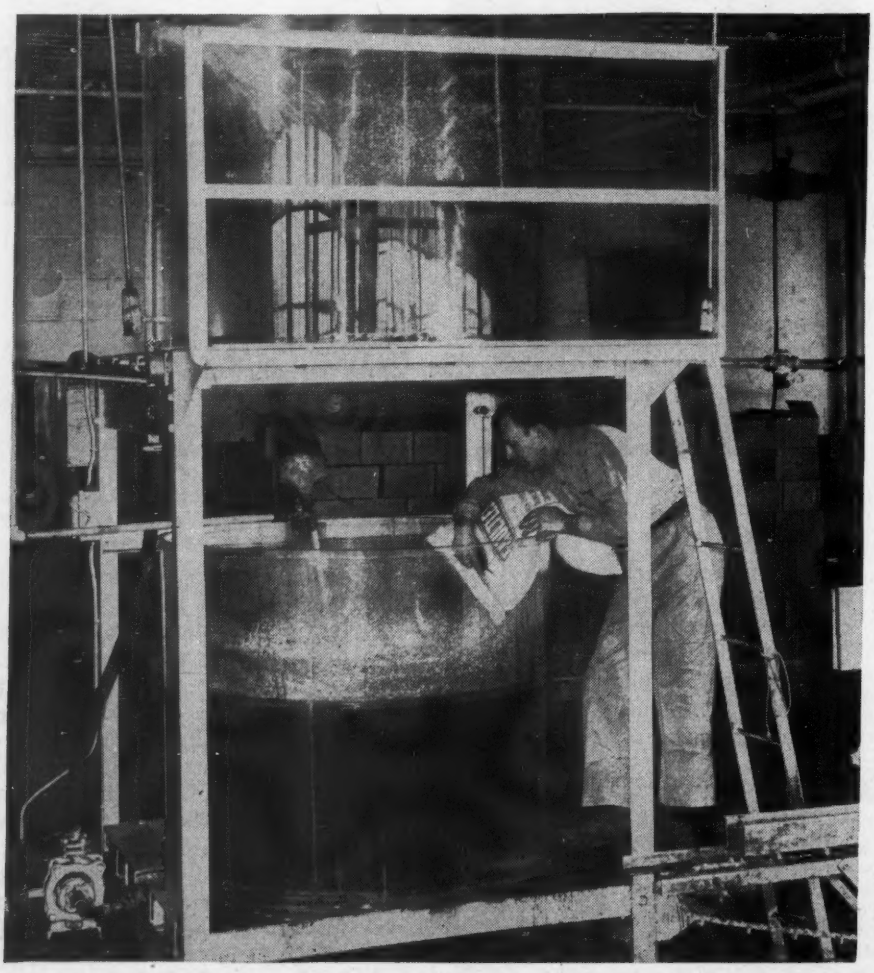
Fabricated tanks of Plexiglas are working out well for preparing the brining solution used by a processor of olives. Transparency and sanitation features are two of the advantages of these tanks

MIXING and measuring tanks of Plexiglas, inert and transparent, are being used successfully for brining solution in the New York plant of S. J. Valk & Son. The tanks each hold 300 gal. of lactic acid brine used in packing olives. It was decided to make them of Plexiglas in order to avoid difficulties with certain kinds of metal tanks, and in view of the sanitation problem with wooden vats.

Transparency

Transparency of the Plexiglas tank wall affords an immediate check on the mixing operation and on the level and color of solution. It also simplifies inspection of the tank after cleaning, since film can be readily seen from the outside. The Plexiglas installation has been approved by the New York City Health authorities and has now been in service for several months.

The tanks were made by the Steiner Manufacturing Co., Brooklyn, N. Y., one of the leading concerns in the fabrication of plastic materials. The Steiner company handled many difficult jobs, both special and production, for the Armed Forces during the war. The Plexiglas used for the tanks is the same acrylic plastic as was used for bomber noses. It can be worked by heating to 250 deg. F., then bending over forms. The tanks for S. J. Valk were each made of two ⅝ in. sheets, formed into semi-cylinders cemented together and to a bottom sheet of the material.



Lower Plexiglas tank is used for preparing the brine-lactic acid solution. Mixing motor can be seen at rear of tank. Liquid is pumped into upper tank, then flows by gravity to the packing operation where the brine is filled into jars of olives.

Cementing

The cementing method is all-important for the strength and serviceability of the Plexiglas construction. Joints are machined to V-shaped tongue and groove sections, then united by the "soak" method, with methylene dichloride. After preparation and softening of the edges in this manner, the sections to be joined are clamped until the material has set. The surface of the joint is afterwards refinished. It can be polished by buffing. Buffing with a flexible shaft tool can also be used on the inside of a tank if the surface becomes dull as a result of handling abrasive material. Hardness of the Plexiglas compares with a copper or aluminum surface.

Sanitary Features

Special sanitary features were incorporated in the design of the brine tanks. A triangular fillet 1½ in. x 1½ in. was bent around the bottom of the tank and against the wall. When perfectly fitted, the fillet was cemented in place, thus finishing the inside bottom wall with a radius large enough to minimize lodging of material and aiding cleaning. Similarly, a bead of ¾ in. by 1 in. cross section was run around the top edge of the tank. This feature is easier to keep clean than the usual rolled under rim on a metal vessel.

The Steiner Company recently built two 750-gallon tanks in the shape of highball glasses for an advertising display which uses bubbling liquid with plastic ice cubes also made of Plexiglas.

The tanks in the sign are subjected to the usual outdoor temperature changes. Each holds 400 gallons of liquid, of which 100 gallons are alcohol, used to prevent freezing of the liquid.

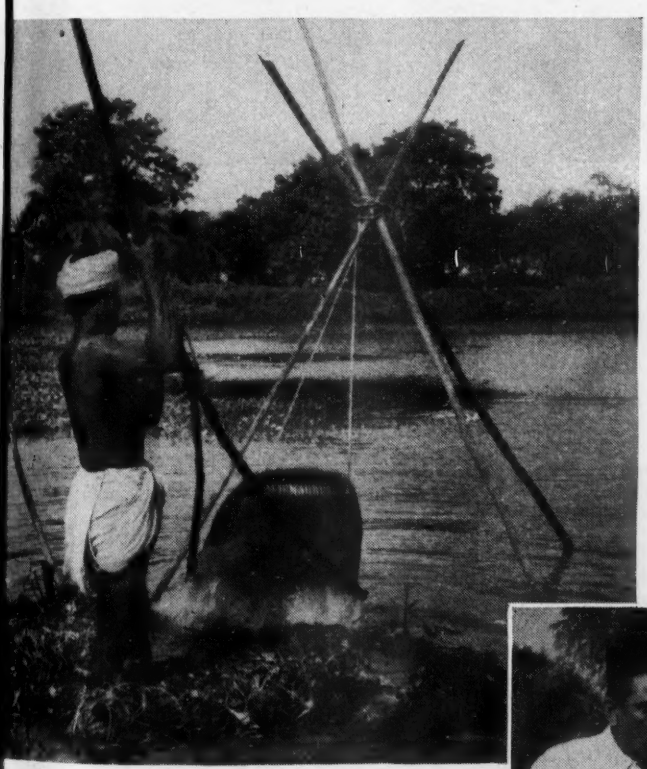
Another use for Plexiglas is for making special sight glasses.

1. After the soil is plowed, the Indian sugar cane grower floods the field, then drops the sticks into the furrows and tramps them down.

This is GUR

Processing of raw sugar cane juice is a primitive operation in India. Between 3- and 4,000,000 tons are produced annually to provide a sweetener and confection for more than 300,000,000 natives

INDIA prides herself on being a large sugar producer. Her 1944-45 output was in excess of 1,200,000 tons from more than 150 factories. The total invested capital in the industry is around $100,000,000. But of even greater importance to the Indian peasant—and a contributing factor to the decline of Indian sugar imports—is the rural manufacture of *jaggery*, or *gur*, the raw and unrefined cane product that is a staple of diet. At least once in the past decade *jaggery* production has topped 4,000,000 tons. Official 1946 totals probably will reach 3,000,000 tons—all of it turned out at small, primitive rural "factories," such as the one shown here, under conditions which would give an American refiner the jitters. Only 10,000 tons of the total goes on to sugar mills for refining. The balance, resembling maple sugar in appearance if not in taste, is the standard sweetening agent and confection for the more than 300,000,000 lower-class Indians.



2. Through the growing season he irrigates his land by standing all day in kneedeep water and hoisting scoopfuls into his ditches.

3. "Experts" conduct a last minute test to determine whether the cane is ready for crushing.

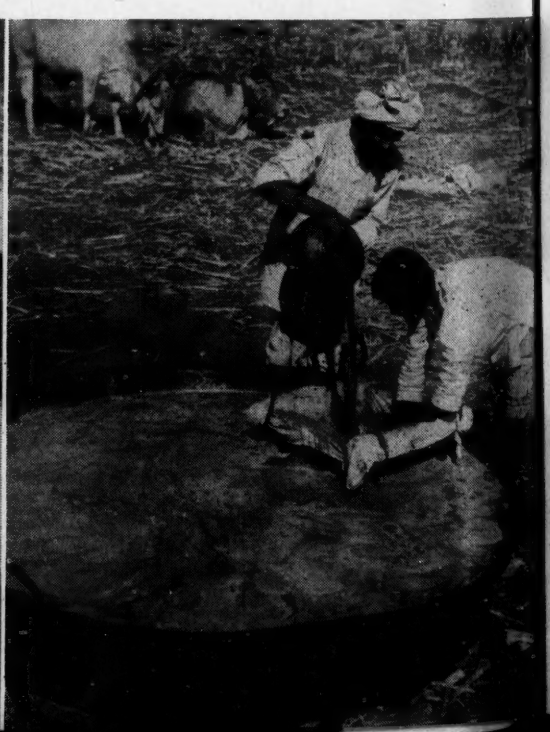
A McGRAW HILL World News FEATURE

4. By bullock cart and coolieback, the cane is brought to mills such as this, where more bullocks turn the battery of grinders.

5. Feeding the cane into the grinder is an all-day squatting job.

6. From the grinder the juice flows into a tub set in the ground.

7. From the tub the juice is scooped up in buckets and poured into huge open pans, where the only "fancy" touch comes in—straining it through a coarse cloth.



8. The strained juice is boiled over crude underground ovens.

9. During the boiling it is skimmed repeatedly.

10. The "taster" decides when the processing operation has been completed.

11. The product is then poured off into earthenware crocks to cool, solidify and WAIT for buyers.

What's Ahead in Milk Processing

Part II—Plant location and character are related to raw material supplies and markets. Intra-industry and inter-commodity competition influence type of products. Diversification entails adjustments in equipment and services

By M. E. PARKER, Counselor in Food Production Development, and
E. S. STATELER, Associate Editor, "Food Industries", Chicago

IN Part I (FOOD INDUSTRIES March 1947) emphasis is placed on the importance of employing technology to obtain positive control over processing operations and to assure high quality in finished dairy products.

Although the technology factor is of highest importance to the future of the milk processing industry under peace-time conditions, it is not the only factor which must be considered.

No matter how effectively technology may be used to produce high quality products it will have been employed in vain—even at a relatively low unit-cost for processing—if the plant is not located correctly in relation to its supply of liquid milk or in relation to an adequate market for its products. Geographic economics has a distinct bearing on the break-down of operations in a plant engaged wholly in processing or manufacturing, and in one engaged in both processing and distributing activities. The function of the plant should determine its geographic location.

Dairy States

In the so-called "dairy states" such as Minnesota, Wisconsin and Iowa, production of milk permits daily receipts in the range of 50,000 to more than 250,000 lb. obtained from areas within a radius of 10 to 15 miles. Wartime demands have been responsible for these receipts being in the form of whole milk instead of as cream. Obviously, that practice is likely to continue because the dairy farmer has learned that the nonfat constituents of milk have cash-money value. For this reason the plants in the dairy states will continue to be dairy-products manufacturing plants. Peace-time diversification of functions of these plants probably will materialize in a manner such that the non-fat solids of the milk will be mainly utilized for the manufacture of cheese and concentrated or dried milk products.

This conclusion is based on two assumptions: 1, That the per capita consumption of cheese will eventually resume its prewar upward trend and 2, that the consumption of dry milk solids will take an eventual upward trend as the result of either compulsory or competitive enrichment programs for other foods using milk as an ingredient. These assumptions are likely to become facts, although a slump is resulting from the curtailment of military and relief feeding demands. Resumption of butter production in these areas can also be expected; in fact is already occurring. To this end, butter quality no doubt will prove an appreciable factor, not only in realizing a restoration of the normal prewar consumption of butter but, eventually, in stimulating an increased upward surge in demand resulting from an expansion of its prewar market. Also, in the case of butter, technology will play an important role in expediting its relatively more economical processing with other accompanying advantages of supply and demand factors. These conclusions, however, are subject to extensive revision if attempts are again made to ignore the normal economic position of butter among dairy products as the market balancing factor.

Volume Plants

Taking these production and economic factors into consideration, assumption appears reasonable that the large volume-plants located in the "dairy states" will begin to settle down in the near future to turn out combinations of processed products. These "volume" operations will embarrass the smaller "crossroads" factories from the standpoint of production efficiency and marketing facilities. These economical operations and superior marketing facilities appear to be evident because of the consistent progress made by the larger companies with good management and operating personnel. However, rivalries between the large plants may result in the loss of some of their production economies through additional hauling costs to obtain their needed volume of liquid milk. But, unless competition between the large plants gets out of control and runs wild, reasonable assumption can be made that the small cheese factory or creamery will be the one which will be hard pressed for raw supplies. This condition will exist except in those cases where specialty items result in market developments that offset the usual disadvantages of small-plant operations. Some of the small milk processing plants are at present being converted into specialty plants, even to the point of being rebuilt and equipped with processing units not previously used in them.

Another economic and competitive factor to be taken into account in peacetime dairy product production and distribution is the growing popularity of ready-to-use dry and frozen mixes and full-meal combinations being merchandised by frozen-food stores.

A third economic and competitive factor to be considered is the likelihood of an increased foreign market for dry milk products. The

potentiality of these markets is indicated by those South American countries whose public health programs demand packaged processed foods. An example is the Mexican market now being exploited with processed food products, especially rehydrated milk.

In any appraisal of the technological trends in the larger dairy manufacturing plants, the incentive for more economical operations obviously is of first importance. A coming revolution in butter-making undoubtedly will usher in the long-cherished "continuous" processes. The "volume" plants will more readily adopt such processes and their incidental production practices because the capital additions necessary for acquiring the essential equipment may prove beyond the reach of the small creamery. Then, too, the "write-off" in obsolescence will be prohibitive to the small creamery unless it can diversify.

Improved Efficiency

We shall probably witness also another revolution in the technology of milk drying. The engineering fallacy inherent in conventional drying systems, the wasting of B.t.u.'s by permitting their escape into the atmosphere, will be recognized and corrected. Methods under development will reduce conventional drying costs to a surprising degree. Then too, extensive building alterations to house the drying equipment will become unnecessary. Even today, modifications of conventional driers are accomplishing a marked increase in overall drying efficiency, as measured by the ratio of B.t.u.'s expended in fuel consumption, to the amount of water evaporated. In some instances this efficiency has been increased as high as 80 percent when compared with the usual 40 to 55 percent values of some of the more commonly used spray drying equipment. The engineer also is making possible similar economies in condensing operations.

In view of the general tax situation, many companies, instead of assuming extensive capital additions, will find the financing of essential, new and expensive equipment made attractive by equipment trusts so that the processor may realize operating economies without undue penalties. Such a trend already is apparent in the financing of ice-cream dealer cabinets by at least one major dairy-products corporation. Incidentally, this practice was preceded by a similar procedure in decentralizing the procurement and maintenance of this company's automotive delivery equipment.

War Beneficial

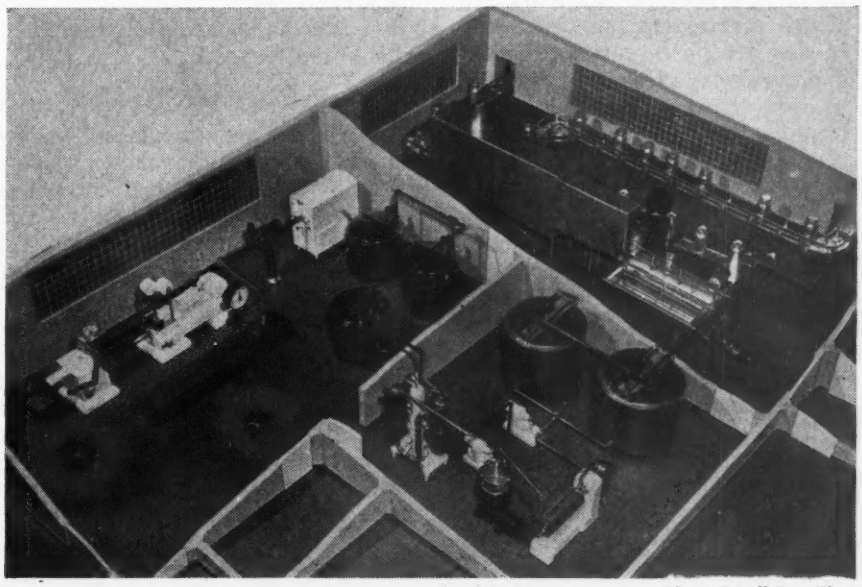
In spite of all the stresses and strains that the war programs have created, certain beneficial influences have become apparent. We find, for example, that many dairy manufacturing plants, which entered the war period covered with a mortgage, have paid off such debts. Again, the dairy industry has profited from incentives that have created a desire for modernization as well as a willingness to spend money for improvements; a situation which did not prevail prior to the war. This has come about from the realization that discarding a fairly successful piece of equipment for an improvement often is good business practice. However, as a brake upon all these trends, we find that few plants have succeeded in setting aside reserves for use in the postwar period. This lack of reserves will be the basis of a modernization problem whose possible solution will be found in equipment-trust financing; the expense of which can be absorbed as an operating cost.

All of the foregoing presages increased efficiency in operating which incidentally may extend into the field of raw materials production and procurement. No crystal ball is required to predict a growing industrialization of farm-production units whose development may be accomplished by harnessing the arts and sciences of agronomy and husbandry in a double hitch. As previously noted in Part I, canners already have blazed a trail in agronomy which the milk processors may soon find of progressive importance to their own successful operations.

Diversification

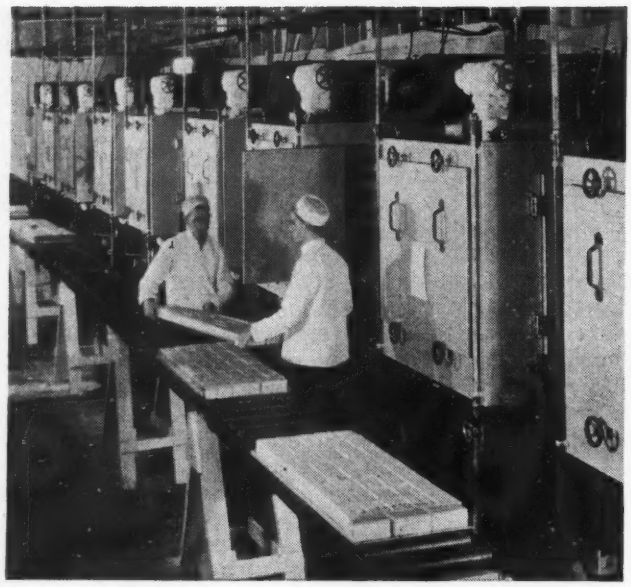
Diversification in the manufacture of dairy products can develop readily into expansion upon a broader base which might include certain frozen-food products. No one needs to argue the advances made in the marketing of frozen foods prior to the war. The frozen food processors have continued to extend their market by increasing the quantities consumed in the face of war conditions and in spite of some merchandise of questionable quality produced and distributed by promoters who rushed into the field without adequate "know how." The future prospects for still wider expansion point to an extensive development in the Middle West agricultural areas; particularly as quality requirements are raised. Today the bulk of frozen foods are processed in the coastal states adjacent to truck farming operations. For that reason, as the market expands it is only natural to expect increased production in all agricultural areas; particularly where fast-freezing facilties are available.

Meat-packing has long been recognized as being founded on and fostered by the development of com-



Cherry-Burrell Corp. Photo

New butter plants of the postwar era will probably include a continuous butter-making process using both standard and specially designed equipment. This is a small scale model of an efficient layout of processing units for such a plant.



Dairy product plants considering diversification may install multi-plate freezers for quick freezing consumer-size packages.

TVA photo

The processing-distributing plant, usually in or near a city, may logically add a frozen food locker unit, such as this.

mercial refrigeration. Heat sterilization and packaging technology have contributed to the founding and expansion of extensive and far-flung factories for the canning of fruits, vegetables, meat and fish which, generally, make little, if any, utilization of refrigeration. Milk processing has enjoyed its wide expansion around the use of rapid transportation and refrigeration just as did meat-packing. Now the big question to be resolved is whether or not the canner, with his technology and production experience, will prove able to absorb and apply the essentials of refrigeration in the coming development of fast-frozen foods processing. Or can the dairy operator, with his experience in refrigeration, expeditiously acquire the essential technology and agronomy already so highly developed by the canners. An edge might be found on the side of certain sections of the dairy field, if only due to the fact that its operations are not as seasonal as are those of the fruit and vegetable canners. Whereas the production of milk is greatest in the spring and early summer months, fruit and vegetable processing is heaviest during the summer and early autumn months. On the other hand, milk processing is much more of a year round activity than is fruit and vegetable processing.

Milk Processor vs. Canner

In any event, mastery of the essential technologies will lead undoubtedly to competition between the milk processors and the canners for expansion into the freezing of fruits and vegetables. This mastery is of great importance in any successful diversification upon the broad base of any integrated division of the food-processing industry such as milk processing.

A noteworthy factor in this intra-food-industry competition is the fact that canners are already experienced in the procurement and preparation of fruits and vegetables for processing; whether for canning, freezing or drying. Milk processors, however, are familiar only with the application of refrigeration. By some means or manner they will have to acquire the knowledge and experience that the canners already possess, if they expect to expand into the freezing of fruits and vegetables.

Refrigeration Needed

While we are speculating on the subject of expanding and broadening any bases of diversifications, it should be recognized that the condensary, the milk-powder plant, the cheese factory and the creamery will all have to augment their normal refrigeration facilities. Ordinarily, the operations in these plants do not call for the heavy refrigeration loads that fast-freezing requires. In fact, most dairy plants already are hard pressed to meet their peak loads during their surplus seasons with their present refrigeration. Therefore, the normal refrigerating capacities found in such dairy plants most certainly would prove inadequate to operate a frozen-food installation.

The present trend is to decentralize refrigerating facilities through the use of portable or semi-portable cabinet-type coolers or compressor units. This development in refrigeration is analogous to the shift from central-power sources with overhead drives and pulleys to decentralized, direct-power-driven equipment, such as has become common during the past 10 to 15 years.

If frozen-food processing is to be added to the activities of an existing dairy-products plant with limited refrigerating capacity, utilization of decentralized refrigeration is an alternative to an expansion of centralized refrigeration facilities. In a new plant, however, serious thought should be given to the comparative advantages of decentralized over centralized refrigeration or to a possible combination of centralized and decentralized refrigeration.

Postwar Problems

When considering diversification in a dairy-products manufacturing plant, it will be well to keep in mind that many of the postwar problems will be concerned with those created by a milk surplus. Any large surplus will mean an excess of almost every dairy product with respect to ability to maintain satisfactory price levels. The burden of surplus absorption will fall upon relatively few products. Butter and milk-solids-not-fat will probably bear the major load, with the result that non-fat-milk-powder will become a determining factor.

(*Continued on page* 210)

Solvent Extraction Process Applied to Cottonseed

Results of pilot plant operations at Wilson, Arkansas, indicate increased yield of cottonseed oil by solvent extraction, as compared with hydraulic process. New plant starts soon with operating capacity of 200 tons daily

By N. HUNT MOORE, Delta Products Company, Wilson, Arkansas

RECOVERY of 45 extra pounds of oil per ton of seed, at an added profit of $11 a ton, was the inducement for the management of Delta Products Company, Wilson, Arkansas to launch full scale operations of the first commercial continuous solvent extraction plant for cottonseed. This plant with a daily capacity of 200 tons, began operations the first part of this year (1947), following months of experimental operation with an Allis-Chalmers pilot plant designed especially for the new process.

Other important economic advantages over the conventional hydraulic method, such as elimination of the hydraulic press room with its 8 to 10 operators, have been established. Enough products were obtained through the pilot plant operations, to have extensive tests made as to their quality. Refineries which have tested the extracted oil report that it is acceptable in every way for manufacture into hydrogenated shortenings, margarine, salad and cooking oils.

While certain procedures, in the preparation of cottonseed meats before extraction, are still to be determined from operation of the new full-scale plant, all phases of the extraction method have been successfully developed.

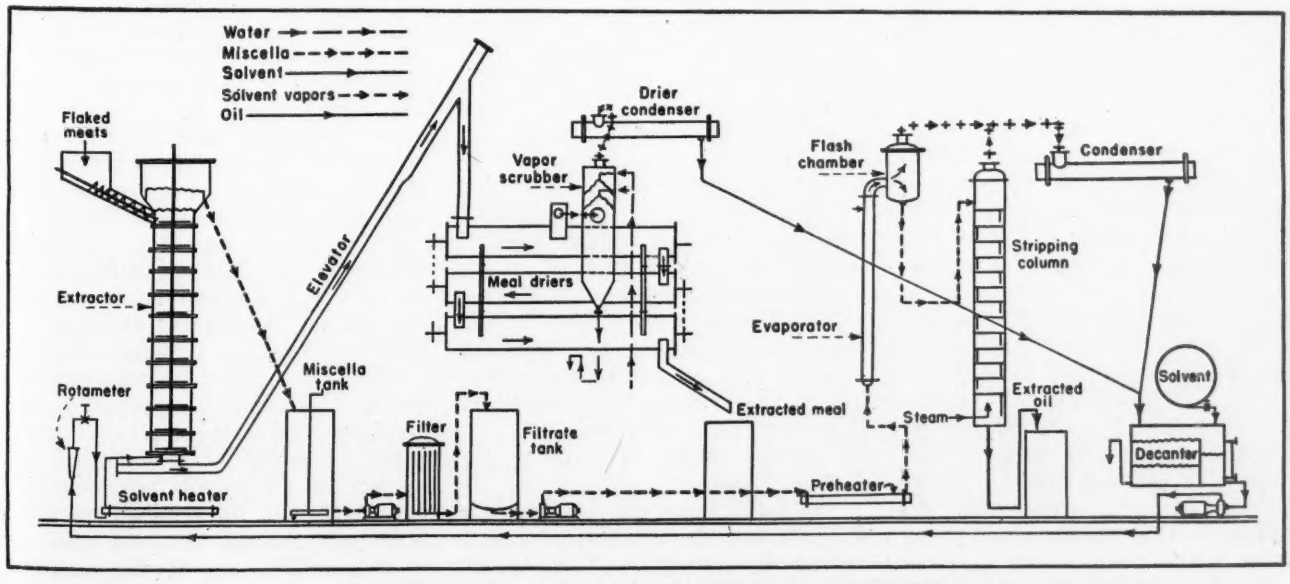
Idea Conceived in 1941

The idea of a pilot mill for cottonseed oil recovery was originally conceived by Allis-Chalmers in 1941. Because the Delta Products Company was already operating a hydraulic press mill, with which the operations could be compared, it was decided to set up this pilot plant at the Arkansas location. In addition, C. W. Hoover, general manager of Delta Products, was greatly interested in cottonseed extraction.

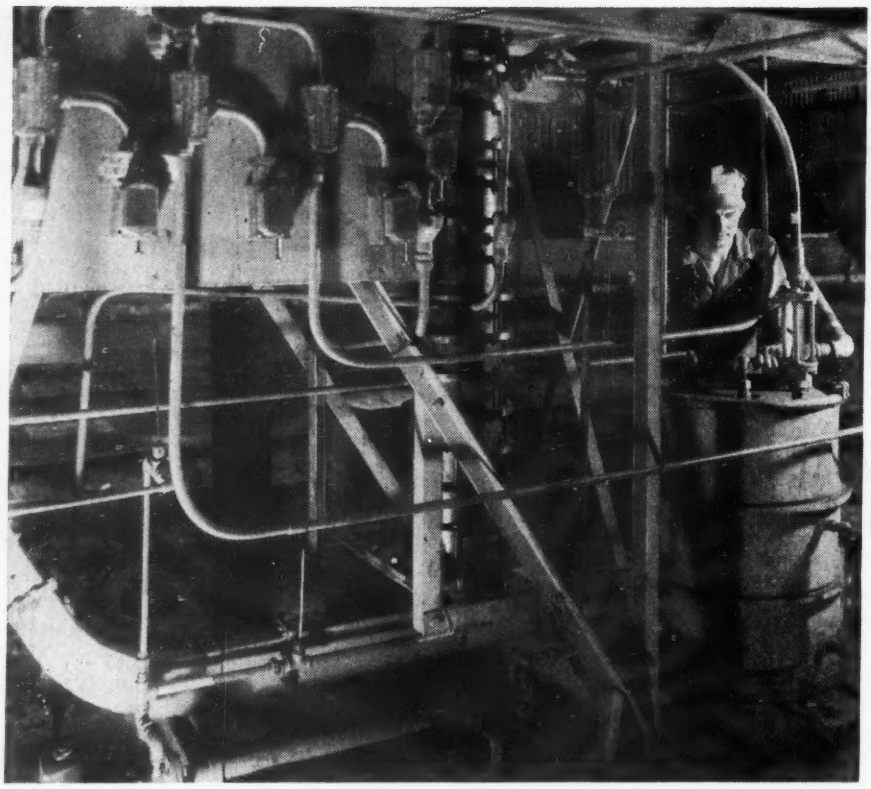
By diverting a portion of the stream of cottonseed meats from the hydraulic plant to the pilot plant, a day by day comparison as to the yields and quality of the products produced was obtained.

Since very little was known about the solvent extraction of cottonseed, it was necessary to make a number of runs with different methods of preparation prior to extraction. The three methods of preparation tried were:

1. Cooked meats as prepared for the hydraulic presses. In this method the meats, as they were separated from the hulls, were passed through a set of five high rolls and then cooked in a pressure cooker for 30 minutes.
2. Raw meats as they come from



Flow sheet of the solvent extraction pilot plant for cottonseed.



Ground cottonseed is fed into the top of the extractor (center) and descends through an upward stream of solvent. The meal, as it leaves the bottom of the extractor, is elevated by means of the Redler conveyor (lower left) to steam jacketed driers that drive off the remaining solvent. Solvent and extracted oil (miscella) flows into the drum (right).

the rolls before going to the cookers.

3. Meats that were cooked in the pressure cooker before rolling.

Pilot Plant Operation

The extractor in the pilot plant consists of a series of glass sections separated by slotted plates. There is a central shaft with revolving paddles above each plate. Rolled cottonseed meats are introduced into the top of the extractor and descend by gravity through an upward current of solvent. The solvent is introduced at the bottom and overflows at the top, carrying the extracted oil with it.

The meal from the bottom of the extractor is elevated by means of a Redler conveyor to a point above the solvent level, where it is discharged onto a conveyor that carries it through the steam-jacketed driers. The solvent vapors escape through an opening in the top of the driers and enter the vapor scrubber. Here particles of fine meal carried by the vapors are removed by means of a hot water spray. The vapors then go to the drier condensers, where they are condensed and returned to the decanter tank.

The miscella, which is the name given to the mixture of solvent and oil, is collected in a tank as it flows from the extractor. It is then pumped through a filter to remove the fine particles of cottonseed meal carried over from the extractor. The clarified miscella is pumped through a preheater, where its temperature is raised to about the boiling point of the solvent, and into the bottom of a long, high velocity evaporator.

The evaporator discharges into a flash chamber, where the solvent vapors pass off to a condenser, and the oil settles to the bottom. This oil, which contains some solvent, flows by gravity through a loop into the top of a stripping column, which consists of a series of perforated trays similar to a distillation column. Super-heated steam is introduced at the bottom of the column and bubbles up through the oil as it flows down from tray to tray. The steam and solvent vapors pass off to a condenser where they are condensed and flow into the decanter tank. The oil, now free of solvent, flows through a loop and into a drum.

The solvent and water mixture in the decanter is continuously separating by gravity. The solvent rises to the top and overflows into the solvent tank where it is ready for reuse. The water settles to the bottom and flows through a "gooseneck" to the sewer. Solvent used for all tests was n-hexane, with a boiling range of 146 to 158 deg. F.

Cottonseed meats for the pilot runs were taken from the stream as it flowed through the cottonseed oil mill. The seed had been de-linted and de-hulled in the conventional way, but contained enough hulls to control the protein in the finished meal to about 41 percent.

Solvent Ratios

Effect of solvent ratios (pounds of solvent introduced into the bot- introduced into the extractor) upon extraction and quantity of fines was studied. The rate of flake thru-put was held constant, while the amount of solvent per pound of flakes being tom of the extractor was varied.

These studies demonstrated that, as the amount of solvent was increased, the residual oil in the meal decreased rapidly at first until a definite flat point on the curve was reached. Time of contact of flakes with the solvent seemed to be the controlling factor of extraction.

Fines leaving the extractor in the miscella, decreased a little at first and then increased rapidly with the increase of solvent. This lowering of fines at first was due to the decreasing density of the miscella as the oil concentration was reduced. The rapid increase of fines with the increase of solvent was due to the greater velocity of the solvent in the column.

From these tests, repeated at various rates of flake thru-put, data revealed the correct extraction time and miscella concentration.

Studies were made on the effect of extraction temperature upon the residual oil in the meal, and upon the color of the oil produced. It was found that extraction carried out at the boiling temperature of the solvent produced a dark red oil, although residual oil in the meal was somewhat lower at the high temperatures. Because of this fact, extraction is not expected to reach the 0.4 and 0.5 percent residual oil that the soybean industry enjoys.

The best extraction was obtained on cooked meats as prepared for hydraulic pressing. When these meats were fed to the extractor at a rate of 76 pounds per hour, a residual oil in the finished meal of 1.06 percent was obtained, and at a rate of 50 lb. per hr. the residual oil was 0.96 percent.

The raw flaked meats gave almost as good results as the rolled and cooked meats. At the 76 lb. per hr. rate a residual oil of 1.92 percent was obtained and at a rate of 50 lb. per hr., 0.98 percent.

The extraction of the cooked and rolled meats was not satisfactory. Since the physical appearance of the material left some doubt as to whether sufficient rolling was obtained, explanation of this might be in the rolling or flaking of this material. Because of the arrangement of the five high rolls it was necessary to feed these meats through the bottom pass only.

The rolled raw meats produced an oil with a refining loss about 1.5 percent to 2.0 percent higher than that of the cooked meats, due to the extraction of certain phosphatides that are rendered insoluble by proper cooking. The color of this oil was about the same as the oil from the cooked meats.

The proper method of preparation of cottonseed meats before extraction will be determined from results obtained from the commercial plant's operation, which is being set up with flaking rolls of the type used in soybean extraction plants. The conveying system is arranged so that either cooked or raw meats can be extracted, and so that the extracted meal can be "toasted" in the pressure cooker.

Results

Judging from the pilot plant results, the cottonseed oil produced in the new commercial plant will be a very bright yellow color and will contain about 1.0 to 1.5 percent residual oil. The extracted oil should have about the same refining loss and color as would be found in the oil produced by a hydraulic press mill from the same seed. It will be free of any odor or taste of solvent, free of fine meal settlings and very low in moisture and volatile matter.

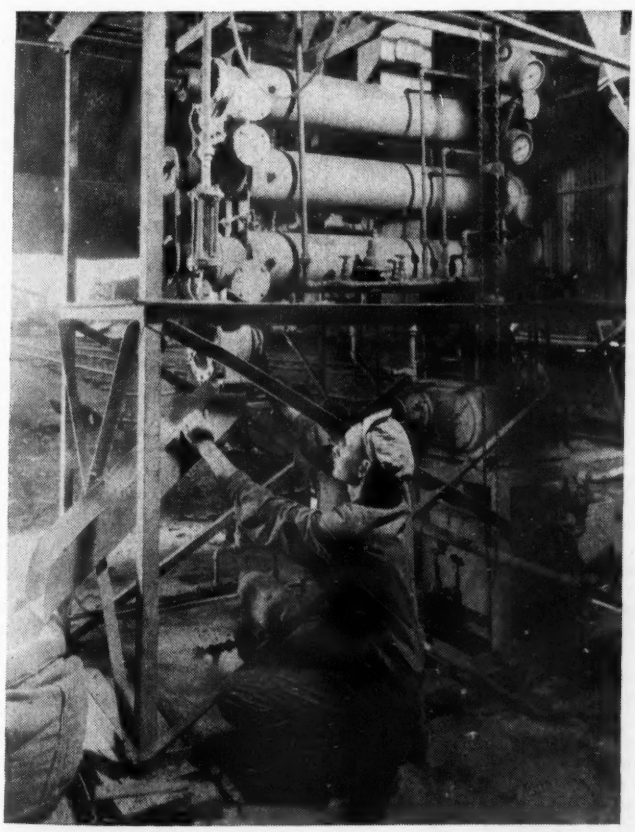
Electrical requirements will be about 20 kwh. per ton in addition to the power that is now required to clean, delint, and decorticate the cottonseed. The overall power requirement will be about the same or a little less with the solvent process than with the present hydraulic process.

Steam needed for drying the solvent from the meal and removing the solvent from the oil, will be about 800 lb. (at 125 psi.) per ton of seed in excess of present requirements. Water required will be about 1,000 gal. per ton of seed. This is used in the condensers and coolers where the solvent vapors from the driers and distillation equipment are recovered.

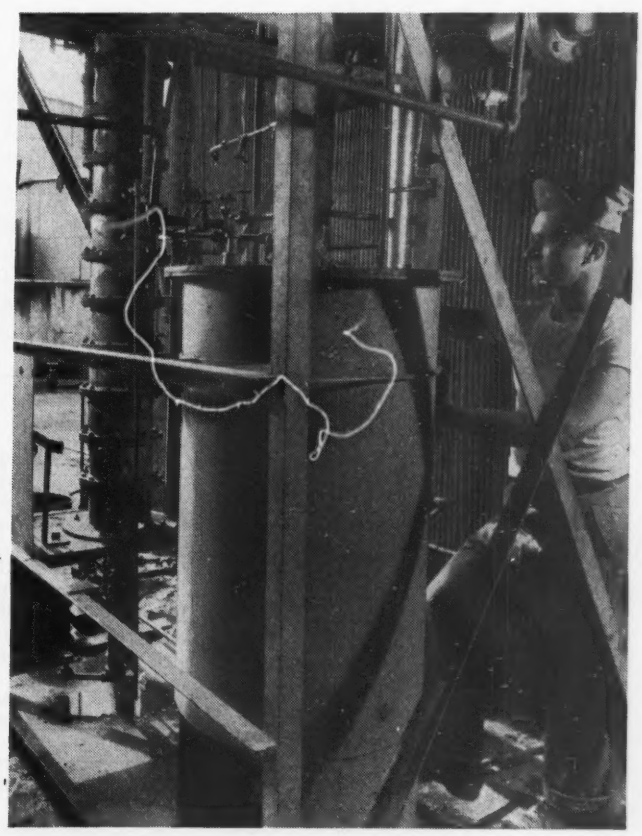
Labor needed to operate this plant will be somewhat less than with the hydraulic system. It will take two men in the extraction building as compared with from 8 to 10 men required in the press room to handle 200 tons of seed. At the present wage scale, this will mean a saving of about 75 cents per ton of seed.

It will be possible for a commercial plant to operate consistently with a residual oil in the meal of between 1.00 and 1.50 percent. Since the hydraulic operation leaves about 5.50 to 6.25 percent oil in the meal, this would mean a saving of about 45 pounds of oil per ton of seed processed. The overall gain in profit compared with a hydraulic mill will be about $11.00 per ton.

As results obtained from this commercial continuous solvent extraction plant will have a tremendous effect on the future trend in cottonseed processing, in this country as well as in South America, the eyes of the cottonseed industry are focused upon it.



Extracted cottonseed meal is conveyed to the steam driers (above) where the solvent vapors are driven off and condensed for reuse. The dried meal is filled into bags and sold.



After leaving the flash tank the oil flows into the top of the stripping column (left). Superheated steam, introduced at the bottom, carries the remaining solvent off to a condenser.

Who Is Liable For Trichinosis?

Apparently this is the first published study of court decisions involving damage claims for trichinosis. The nature of legal liability is beginning to emerge. Care must be exercised in production and sale of pork products

By JAMES A. TOBEY, Member of the New York Bar, Rye, N. Y.

ON numerous occasions persons who have consumed improperly cooked pork and pork products have contracted trichinosis, a disease due to the presence of viable trichinae in the meat. They have, on numerous occasions, sued the producer, the retailer, or the restaurant keeper who has sold them the product. Only rarely have they been able to collect damages. Such litigants have been successful in a few jurisdictions, but not in others.

Since 1897 Federal and State courts of appeals have handed down some 30 decisions involving liability for trichinosis. In most of the jurisdictions the rule has been laid down that raw pork infected with trichinae is not an unwholesome product under the statutes governing foods. It has been pointed out that trichinae in pork can not be detected by ordinary methods of inspection, but only by microscopic examinations of all portions of the meat. It is further stated that pork is not intended to be eaten raw, but must be thoroughly cooked, and that cooking to a temperature of at least 137 deg. F. will destroy the trichinae. A consumer who fails to do this is negligent.

On the other hand, liability for trichinosis has been sustained in New York under the doctrine of implied warranty, and in Ohio and one or two other jurisdictions under the doctrine of negligence. Where this latter principle prevails the reason for it has been stated to be that the statutes prohibit the manufacture, sale, or delivery of any food that is adulterated. The law generally defines adulteration as including any meat which consists wholly or in part of a diseased, decomposed, putrid, infected, tainted, or rotten animal. Pork containing trichinae is considered in these jurisdictions to be adulterated within the meaning of the law, which usually makes such adulteration a crime.

Implied Warranty

In 1916 the Court of Appeals of New York decided in the leading case of *Rinaldi v. Mohican* that a person who bought pork from a retailer and was made ill with trichinosis by consuming it was entitled to damages, since there was an implied warranty that the pork was wholesome.[2] Nineteen years later this decision, which was an important one in the law of sales, was affirmed by a divided court,[3] and it was again upheld in 1938.[4] In the following year it was decided by the New York Court of Appeals that a restaurant keeper who served smoked pork to a customer without properly cooking it was liable for trichinosis on a breach of implied warranty, but that the restaurant keeper had no case against the wholesaler who furnished the infected product, since it was known that the meat must be properly cooked before serving.[5] In a more recent case a lower court in New York ruled that there was insufficient evidence to sustain an action on implied warranty,[6] but an action has been upheld against a packer who sold salami containing trichinae to a retailer for resale without cooking.[7] In this case it was the retailer who recovered from the packer.

The New York courts have awarded damages for trichinosis under the doctrine of implied warranty, but have consistently refused to sanction such damages under the doctrine of negligence, holding that trichinae-infected pork does not violate the State Agriculture and Markets Law. This principle was first enunciated by a Federal court in New York in 1917,[8] and has been followed since that time by the lower New York courts in a number of decisions.[9]

Employee of Restaurant

To the same general effect have been decisions in Illinois, where the first of these cases was passed upon,[10] Maryland,[11] Massachusetts,[12] Michigan,[13] Pennsylvania,[14] and Wisconsin.[15] All hold, in general, that the use for which pork is purchased

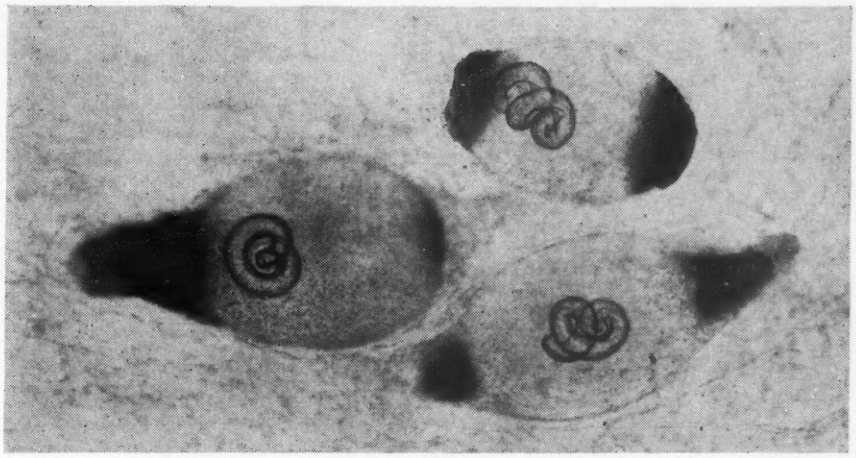
Let the Seller Beware

It is a well established principle of law in this country that a vendor of unwholesome food is liable to the consumer for injuries or disease caused by the food. He is, furthermore, liable regardless of any intent or motive on his part. In such instances the rule of *caveat emptor* is reversed as a matter of public policy. It is the seller who must beware, not the buyer.[1]

Whenever food is sold for human consumption there is an implied warranty that it is fit for the purpose intended. Such a warranty is based on privity of contract between the vendor and the vendee, and it extends to every member of the family of the purchaser. For a breach of this warranty the injured person or his heirs may recover suitable damages, provided, of course, that he can show actual causal relationship between the disease or injury and the food.

An action for breach of contract is, however, not the only remedy in cases of harm due to unwholesome food. The afflicted individual may also bring an action for negligence, which is a tort or legal wrong. If the seller or producer of the food has been guilty of the violation of a statute or valid regulation, negligence will be presumed as a matter of law. The buyer must, nevertheless, be free from contributory negligence, and if this can be shown he cannot recover damages. — The author.

is to eat it cooked and not raw, and that the wholesomeness required by the pure food laws applies to pork that is properly cooked. In Massachusetts, however, it has been held that an employee of a restaurant who contracts trichinosis from pork furnished by the employer as part of the pay of the employee has suffered an injury under the workmen's compensation act, which entitles the employee to compensation.[16] Liability has also been upheld in Massachusetts for trichinosis contracted from ham which was alleged to have been thoroughly cooked.[17]



National Institute of Health, U. S. Public Health Service photo

Encysted larvae of Trichinella spiralis in the diaphragm of man (mag. 250X).

Infected Pork Sausage

In Ohio the rule is somewhat different. In 1936 the Supreme Court of that state sustained an award to an individual who had purchased pork sausage in a chain store and was made ill by it, even after it had been fried.[18] In this case the liability was predicated upon a statute which prohibited the sale of diseased, corrupted, adulterated, or unwholesome provisions without making the condition known to the buyer. In a subsequent case a packer was held liable in Ohio for selling smoked pork infected with parasites to a retailer who sold to the plaintiff in the form of smoked sausage.[19] The case in favor of the plaintiff was, however, reversed because he had joined the packer and retailer as parties, when he should have sued each separately. The liability of the packer was stated to be primary, and that of the retailer secondary.

A boarding housekeeper bought pork which she fried and served to a boarder, with the result that he contracted trichinosis. It was held by a Federal Circuit Court of Appeals in Ohio that the boarder had a good cause of action against the retail grocer who sold the pork and against the wholesaler who furnished it to the retailer.[20] It was held that the sellers were negligent, that their negligence was the proximate cause of the injury, and that any contributory negligence on the part of the landlady could not be imputed to the boarder.

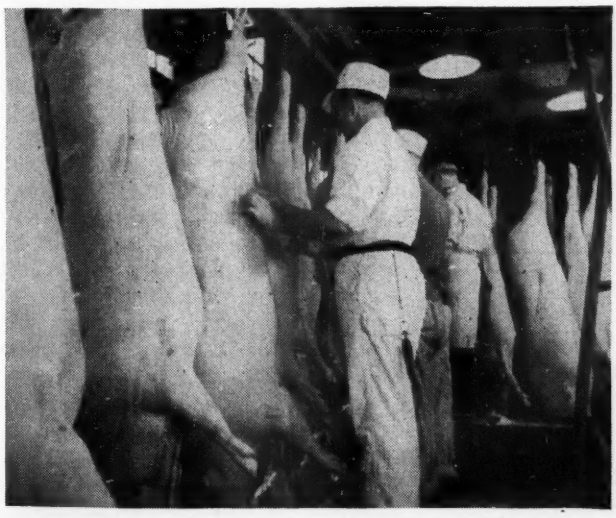
Trichinae-Infected Metwurst

In two recent cases in Ohio, the same principle has been followed. In one of these cases a man died as the result of eating trichinae-infected metwurst which had been smoked but not cooked. Judgment in favor of the administratrix having been given in the trial court and affirmed by the Court of Appeals, the case came on review to the Ohio Supreme Court, which affirmed the decision on the grounds that the product was adulterated under the state laws.[21] In the other case liability was denied for lack of evidence, but the Court pointed out that trichinae-infected meat did not qualify as wholesome under the statutes, and that the injured purchaser was entitled to some practical remedy.[22] Although a heavy burden is placed on the seller, said the Court, he may properly require a warranty from the person selling to him. There is also an obligation on the buyer not to eat pork in an uncooked state, especially when he has knowledge or means of knowledge that it must be properly cooked.

Trichinae-Infected Salami

In two other jurisdictions there have been somewhat less conclusive decisions on the legal liability for trichinosis, although they indicate that damages would be awarded under the doctrine of implied warranty. In California it has been held that it is a matter for the jury

(*Continued on page* 220)



Federal inspector examining pork carcasses on rail conveyor.

Motion Picture Service, USDA photos

All the viscera are also closely examined by the inspector.

Delivery Costs By the Case

This system, devised by the bottlers' association, gives the distributor the true overall unit costs of his truck delivery operations throughout the year

THREE principal forms make up the delivery cost system developed by the accounting service of the American Bottlers of Carbonated Beverages, Washington, D. C. They enable any beverage bottler to determine the true overall and unit cost of his motor truck delivery. The need for accurate knowledge of such expense is apparent since, in some cases, as high as 30 percent of the selling price of the product goes into the upkeep of the delivery service.

A.B.C.B.
Form—Rev. 3

DAILY TRUCK OPERATION AND MAINTENANCE REPORT

For Bottlers' Sales-Delivery Trucks

Truck No. _____ Date _____, 194__

METER READING (Out Trip) (In Trip)

In Use
No. Hours _____ Mileage—Finish _____ _____

No. Trips _____ Mileage—Start _____ _____

No. Stops _____ Mileage—Today _____ _____

INSERT ROUTE NO. OR DESTINATION FOR EACH TRIP IN COLUMN HEADING →						
PROPERTY CARRIED	CASES	TONNAGE	CASES	TONNAGE	CASES	TONNAGE
OUTGOING FULLS						
OTHER (SPECIFY)						
INCOMING FULLS RETURNED						
EMPTIES						
OTHER (SPECIFY)						
CASES DELIVERED						
TOTAL OUTGOING AND INCOMING						

GASOLINE	GALS.	0	$
OIL	QTS.	0	$
REPAIRS (DESCRIBE)		PARTS	$
		LABOR	$
		REPAIRS TOTAL	$
TIRES MOUNTED NO.	☐ NEW ☐ RECAPS ☐ RETREADS		$

MAINTENANCE INSPECTION at Mileage _____

TIRE MAINTENANCE - ☐ Inflated ☐ Inspected ☐ Switched

Condition of Tires _____

Remarks _____

Signed

_____ Checker _____ Driver

Fig. 1. The driver's daily report gives the basic data on the work done on every trip

The three forms that make up the system include a Daily Truck Operation and Maintenance Report, reproduced herewith in Fig. 1; a Monthly Truck Record, shown in Fig. 2; and a Semi-Annual Recapitulation Sheet, shown in Fig. 3.

The forms are not designed to displace any established bookkeeping system in the bottling plant. Rather they are intended to supplement the existing records by making it possible to analyze, more completely, the costs of distribution.

The Daily Truck Operation and Maintenance Report is employed to build up, by individual truck number, the basic daily operating and maintenance data, such as the miles run, trips made, hours in use, number of full cases out and empty cases in, the amount of gasoline and motor oil used, the number of tires changed, if any, and the character of repairs made to the truck, if any. There are also spaces for the separate cost of parts and labor to be filled in subsequently.

These daily items are then entered on a separate line for each day on the individual Monthly Truck Record. Additional columns are provided for the daily insertion of the driver's wages and commissions, and for a monthly pro-rata entry for fixed charges.

Adding up the lines for the days of the month on the report gives the total cost of the truck for the month, together with the miles run, trips made, etc., and the number of full cases delivered and empty cases picked up. By dividing by the number of working days in the month, it is a simple operation to obtain the average cost per day, per mile run, per hour operated, etc., and the cost per case delivered.

One Fig. 2 sheet is made out for each individual truck for each month of the year. These monthly totals are inserted in separate vertical columns in the Semi-Annual Recapitulation Sheet. The records for the first six months of the year are carried on one side of the sheet and the last six months on the other, with columns for making the figures accumulative to each month of the year. Thus when the figures

A. B. C. B. BOTTLERS DELIVERY COST SYSTEM — OPERATION OR ROUTE NO. _____ MONTH _____

Form A — **MONTHLY TRUCK RECORD** — DRIVER _____

Date	OPERATING RECORD												DISTRIBUTION OF OPERATING COSTS										Fixed Charges	Cost per Case Del'd
	Hrs.	Type	No. Trips	No. Stops	Miles Out	Miles In	Fulls Out	Fulls Ret'd	M'ties Ret'd	Total Out & In	% Capacity	Cases Sold	Gasoline Gals.	Gasoline Cost	Lubricants Qts.	Lubricants Cost	Tires	Maintenance Parts	Maintenance Labor	Salary and Commissions				
Budget																								
1																								
30																								
31																								
Total																								
Average																								

Fig. 2. The individual monthly truck record, on which the basic data from the daily report is recorded by days. By adding the columns, the total truck record for the month is obtained. Twelve such sheets are included in a year's supply.

for the last month of the year are inserted, the total yearly figures are also given, from which the unit costs and the cost per case delivered are determined.

The Daily Truck Operation and Maintenance Reports, Fig. 1, are furnished in pads of 150 each. Six double-faced sheets of the Monthly Truck Report, Fig. 2, and one double-faced sheet of the Semi-Annual Recapitulation Sheet, Fig. 3, together with one sheet of general directions for the use of the cost system, are bound together in a standard letter, or file cabinet size, manila folder. The protruding top tab of the folder has blank spaces for the insertion of the individual truck number and the yearly period covered by the sheets inside.

One per Truck

Thus one folder is used each year for each truck in the fleet. If a bottler has six or twelve trucks in his fleet, six or twelve separate folders will be required to obtain the delivery costs for the year.

An Accounting and Management Series bulletin giving greater details on the application of the cost system completes the set-up. Still other details as to the cost of the forms may be obtained direct from the American Bottlers of Carbonated Beverages, 1128 Sixteenth St., Washington 6, D. C.

It is estimated that the time required for maintaining the system will not be over five minutes per day per truck, with an additional 15 minutes at the end of the month. The expenditure of such amount of time will be amply justified by the benefits accruing. These include adequate control of delivery costs, comparison of performance of the various trucks and bodies used and the results obtained by the drivers on different routes.

Form B — **A. B. C. B. BOTTLERS DELIVERY COST SYSTEM—**

—SEMI-ANNUAL RECAPITULATION SHEET — TRUCK NO. _____ ROUTES _____

Monthly Budget	Distribution and Unit Cost Data	January July		February August		
		Total this Month	Total to Date	Total this Month	Total to Date	T M
	FIXED CHARGES — 6 Month Period					
	Depreciation					
	Interest					
	Insurance					
	Taxes					
	License					
	Garage Rent					
	Total Fixed					
	DIRECT OPERATING COSTS					
	Gasoline					
	Lubricants					
	Tires					
	Maintenance, Parts					
	Maintenance, Labor					
	Salaries & Commissions					
	Painting					
	Total Operating Costs					
	Total Fixed & Operating					
	Total Days Operated					
	" Miles Traveled					
	" Gallons Gasoline					
	" Quarts Oil					
	" Cases Delivered					
	" Cases Out and In					
	% of Maximum Truck Capacity Used					
	Miles per Gallon Gas					
	" per Quart Oil					
	Cases Delivered per Mile					
	Cost per Mile					
	" " Case Loaded					
	" " Empty Case Returned					
	" " Trip					
	" " Stop					
	COST PER CASE DELIVERED					

Fig. 3. The semi-annual recapitulation sheet shows the cost per case delivered, for each month and for the year. It also provides other unit controls such as the miles per gallon of gasoline and quart of oil, and the cost per mile per loaded case. An extra column permits a comparison between actual costs and the budget costs set up for these items.

Army Winter-Tests Rations

Frozen rations are thawed and heated in a new field conditioner. Drop tests made from planes by task forces proved that rations were properly packaged. Suitability of foods and packages will be studied after two years' exposure

THREE task forces were sent on maneuvers last winter by Army Ground Forces in order to: (1) Provide information on suitability and performance of standard and available equipment; and (2) determine equipment required to execute efficient warfare under all types of winter conditions. Task Force "Frost," at Camp McCoy, Wis., operated under normal, cold winter conditions comparable to those in Central Europe; "Frigid," at Fairbanks, Alaska, endured very cold, dry conditions, with temperatures at –40 to –70 deg. F.; and "Williwaw," at Adak, in the Aleutians, experienced fairly mild, wet conditions. The three operations are scheduled to be completed this spring.

Rations being tested at Camp McCoy, Wis., in partially open storage under two-year plan.

Ration "E"

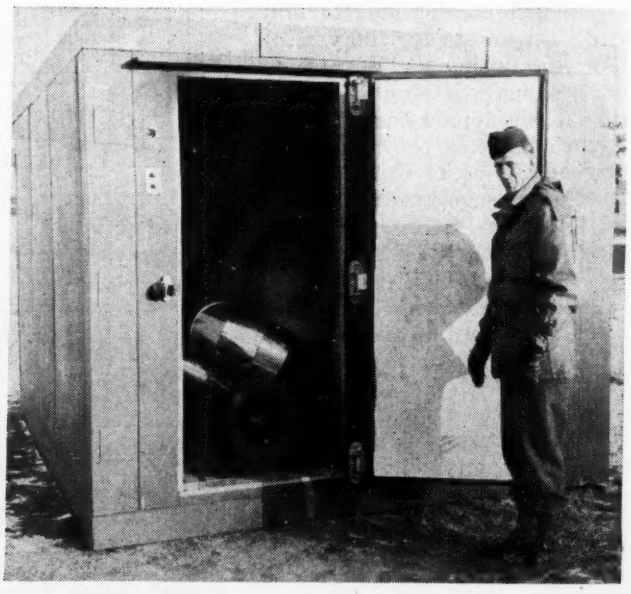
Included in supplies under test is the new "E" type canned ration—a complete ration of three meals for one man for a day. It is similar to the "C" ration used in World War II, except that a bread component is substituted for the biscuit and crackers. Rations are packed in No. 2 tins. Tins are packed in rectangular fiberboard containers, overwrapped and wirebound. The carton weighs 43 lb. when packed.

Ration Conditioner

Task Force "Frost" is testing a new conditioner for thawing and heating rations for 250 men in one operation. It is an oversized icebox with a heating unit to circulate hot air throughout the interior. Temperatures of 0 to 175 deg. F. are produced in 15 minutes. The conditioner is being tested to thaw

(*Continued on page* 216)

New "Type E" ration undamaged after dropping 500 ft. with makeshift parachute from an L-5 observation plane in Aleutians.



Conditioner being tested by Task Force Frost thaws and heats frozen rations to 175 deg. F. It also makes water from snow.

Birds Eye-Snider photo

Straight line production methods introduced by Birds Eye-Snider in quick freezing peas.

Degree of Maturity Influences The Quality of Frozen Peas

PART II—Total solids content and starch content are two good objective indexes of the maturity of peas. Limits are suggested for the starch and total solids contents for the fancy, extra standard and standard grades

By J. P. NIELSEN, HORACE CAMPBELL, C. S. BOHART, and M. P. MASURE
Western Regional Laboratory*, Albany, Calif.

BOSWELL[13] and Jodidi and Boswell[16] have shown that total solids content of peas increases with maturity. Kortesz[17] found a correlation coefficient of -0.824 ± 0.00188 for the relationship between the maturity score for canned peas and their total solids content. Pyke[18] has shown that there is a high degree of correlation between tenderometer values and the total solids content of canning peas. The data presented in Fig. VIII for five freezing varieties grown in Washington show that total solids content of frozen peas increased in a straight-line manner with maturity of the raw peas, as determined by the tenderometer. Similar relations were observed for canning varieties from this area, as well as for the canning and freezing varieties from Utah.

As was true for the relationship between starch and tenderometer values, statistical analysis reveals a high and significant correlation between maturity, as estimated by the tenderometer, and total solids content of frozen peas. With freezing varieties from Washington and Utah, it was estimated that 84 to 90 percent of the observed variance in total solids content can be attributed to variation in maturity, as estimated by the tenderometer.

These results indicate that total solids content of frozen peas is a very good measure of maturity of raw material. The simplicity and dependability of a total solids determination for use as a maturity index give such a determination obvious advantages for practical application. The relationship between the total solids content and texture of cotyledons is shown in

*Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

Fig. IX, based on data for the freezing varieties from Washington and Utah considered together. This relationship is curvilinear, and approximately 92.4 percent of the variance in cotyledon texture score can be attributed to variance in maturity, as estimated by total solids content. This compares favorably with the figure of 90.0 percent previously given for the starch-texture relationship. Suggested ranges in total solids content of potential use in establishing quality grades, together with corresponding tenderometer ranges, are presented in Table I.* The suggested starch ranges, also included in the table, were discussed in part I of this report.

Highly significant correlations have been referred to between starch-total solids contents and maturity, and starch-total solids contents with judges' scores for cotyledon texture. Similarities in the correlation constants indicate that starch and total solids contents can be used equally well as indexes of cotyledon texture in frozen peas. A word of caution is required if the curves are to be used for this purpose. Losses of water-soluble materials, such as occur through excessive blanching or other processing extremes will influence analytical results. An increase in these losses, if not compensated by absorbed water, will result in an increase in the value for starch and a decrease for total solids. Therefore, with starch as a basis, there could be a slight lowering of the score for cotyledon texture, whereas on the basis of total solids the score could be raised slightly. As long as the treatment received does not materially deviate from that employed in this study, however, interpretation of the results will probably not be significantly altered by leaching.

Specific Gravity

Specific gravity, which is commonly used in grading peas, was measured by determining the percentages of defrosted peas with skins removed that sink in 13, 15 and 16 percent salt solutions. In earlier work in this laboratory with 127 commercial samples of frozen peas of different varieties from Minnesota, Montana, Utah, Washington, and Oregon, a significant but low degree of correlation (-0.50 ± 0.045) was observed between score for cotyledon texture and percentage of peas with skins removed that sank in 13 percent salt solution. Such a correlation (0.50) indicates that only 25 percent of the variance in cotyledon texture as measured by the appraisal panel could be accounted for by difference in maturity, as estimated by specific gravity. Because of the human factors inherent in panel appraisal, some other measure of cotyledon texture might give a higher correlation with brine flotation than the one obtained here.

The relationship between maturity, as estimated by the tenderometer and by percentage of sinkers in 13 and 16 percent salt solutions, is shown in Figs. X and XI for freezing varieties of peas from Washington and Utah. An increase in specific gravity is evident with maturity. It is also apparent that for a given stage of maturity, there is a range in the percentage of peas sinking. Some suggestions for improvement in the brine flotation procedure are given in the following section.

In an attempt to study the use of specific gravity further, Lee's method [7, 8] was investigated. Specific gravity of the frozen peas is based upon the relationship between weight of sample in air and its weight in a mixture of xylene and carbon tetrachloride of known specific gravity. Specific gravity by Lee's method, and maturity of the material as determined by tenderometer, is shown in Fig. XII for four varieties of peas from Utah. Only a low correlation between tenderometer values on the raw stock and specific gravity of frozen stock is apparent. Certain errors in the method which may account for this low correlation are discussed in the following section.

Muenchow's data[18], covering six freezing varieties of peas, indicate that only 56 percent of the variance in score for tenderness and maturity, determined on the basis of the brine test for frozen peas, is attributed to variance in maturity of the raw stock, as estimated by the tenderometer. Our data also indicate a low correlation for estimation of texture by brine flotation. The data on specific gravity, obtained by the method of Lee[7,8] (Fig. XII), show a correlation between maturity of raw stock (tenderometer) and specific gravity so low as to disqualify Lee's method of estimating quality in frozen peas. He has reported a coefficient of correlation of -0.8168 ± 0.027 for the relationship between the specific gravity of defrosted peas and organoleptic quality. The coefficient of determination for this relationship indicates that approximately 67 percent of the variance in organoleptic quality is accounted for by variance in specific gravity. Examination of our data shows even poorer agreement between specific gravity and score for cotyledon texture.

Gravity and Flotation Tests

The low correlation with Lee's method is attributable to two factors: (1) The relatively narrow range of specific gravities in the peas studied and (2) lack of precautions. The first is apparently a characteristic of western-grown peas. One necessary precaution is that the temperature of the immersion fluid must be constant. A change of 1 deg. C. changes its specific gravity by 0.001. Room temperature can be used to maintain the fluid at approximately constant temperature, but peas immersed in it, unless at exactly the same temperature as the fluid, can very easily change the temperature a degree or two. Both peas and fluid should be brought to a constant temperature. Entrapped air under the pea skins can also be a source of considerable error, sometimes of as much as 0.01 in specific gravity reading. This factor can be eliminated by tedious removal of skins. Otherwise, a controlled system of compression or evacuation would be necessary to remove the entrapped air. Occasionally a loss in weight, during the first two minutes of immersion, has been

TABLE I—Starch and Total Solids Limits of Potential Value in Establishing Quality Grades for Frozen Peas*

Grade	Starch range, percent	Total solids range, percent	Corresponding tenderometer range
1	Up to 3.70	Up to 18.80	Up to 103
2	3.71 to 4.80	18.81 to 21.20	103 to 128
3	4.81 to 6.40	21.21 to 24.40	128 to 160

*See Charts III and IX and discussion of same.

*Arrived on cotyledon texture basis as presented in part I of this report (section on starch content), and subject to same qualifications as to comparability, but not identity, with commercial grades.

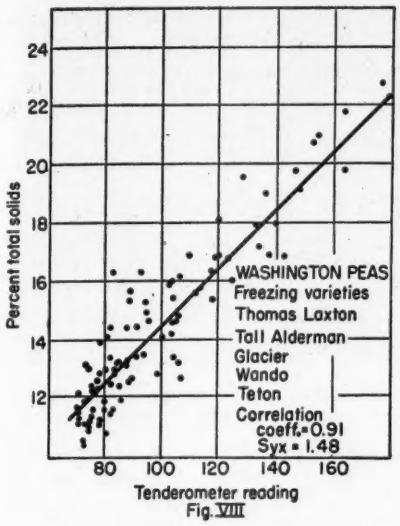


Fig. VIII

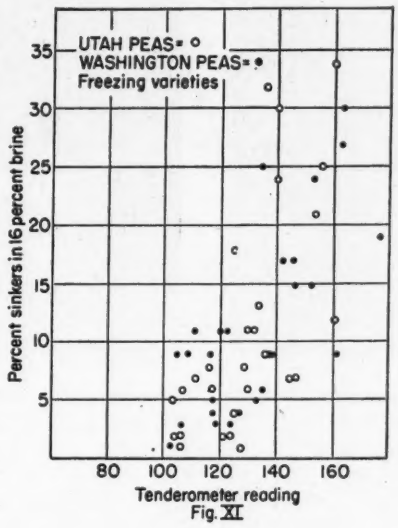


Fig. XI

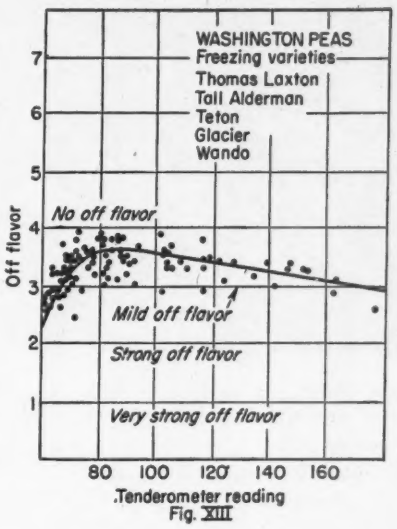


Fig. XIII

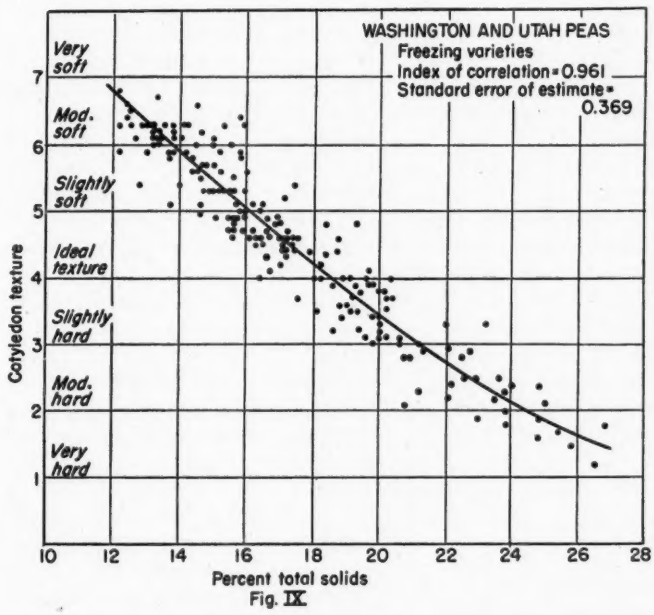


Fig. IX

Fig. VIII. Relation of total solids in frozen peas to maturity (by tenderometer).
Fig. IX. Relation of total solids in frozen peas to cotyledon texture (by organoleptic test).
Fig. X. Relation of flotation of thawed peas in 13 percent brine to maturity (by tenderometer).
Fig. XI. Relation of flotation of thawed peas in 16 percent brine to maturity (by tenderometer).
Fig. XII. Relation of specific gravity (by Lee's method[12]) of thawed peas to maturity (by tenderometer).
Fig. XIII. Relation of off flavor in cooked frozen peas to maturity (by tenderometer).
Fig. XIV. Relation of yield of fresh peas, by grades, to maturity (by tenderometer).

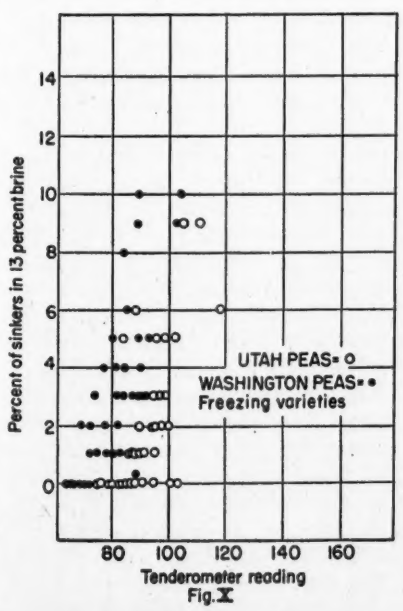


Fig. X

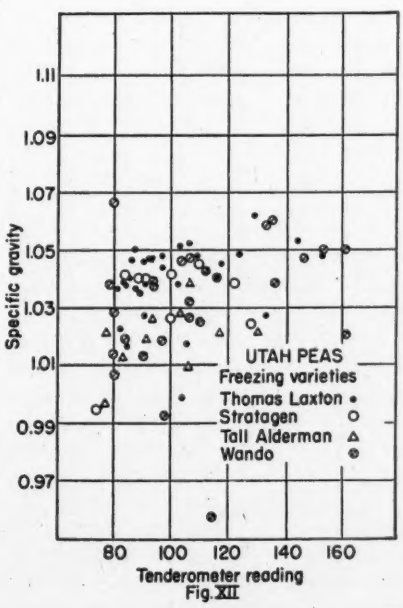


Fig. XII

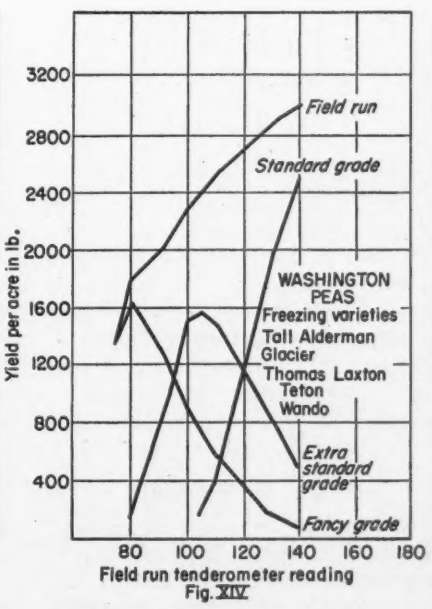
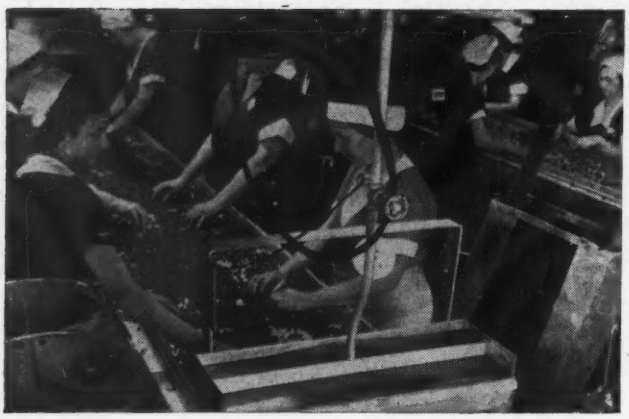


Fig. XIV



Tender, green peas go through many stages of inspection. Foreign material and also damaged peas are removed prior to packaging.

After inspection peas are packaged in cartons, placed in freezer trays, loaded into Birdseye multiplate freezers, and frozen.

observed. This is probably due to exosmotic action, and suggests the need for rapidity in weighing. A further problem, not inherent in the method itself, is that of sampling. A few samples of the weight, recommended by Lee[8], from duplicate packages of frozen peas, varied from 0.001 to 0.01 in specific gravity between duplicates. This observation shows the necessity for much larger samples, or for considerable replication.

With certain improvements in the brine flotation method, it is quite likely that more of the variance in cotyledon texture could be accounted for than has been indicated in this report. Use of the apparatus described by Birdsall[19] greatly reduces labor involved in determining sinkers and floaters, and increases accuracy, since it is designed to use a large number of peas for each immersion. Results of a number of trials have also indicated that differences in specific gravity between samples are more reliable if brines differing by not less than two percent in strength are used, and if somewhere near 50 percent sinkers is set up as the standard for the various quality levels specified. Demarcation between percentages of sinkers in brines differing by one percent is not always clearcut; and if 50 percent of the peas are sinkers, or floaters, the accuracy will be greater than if the critical percentage is set either much above or below that level. Within a range of 40 to 60 percent, numerical accuracy will not be significantly altered for practical purposes.

Abnormal Flavor

An objection frequently raised concerning the quality of frozen peas is the occurrence of an abnormal flavor, variously described as grassy, rancid, or stale. Underblanching, bruising, contamination with juice during shelling in a viner, and delay in handling are some of the factors responsible. Data for off-flavor and maturity, shown in Fig. XIII, suggest that maturity is also a factor. As peas mature, an apparent decrease in off-flavor development, followed by a somewhat slower increase, takes place in low temperature storage. In the early stages, peas are more sensitive to development of off-flavor than in the more mature stages. The slight increase in off-flavor, following the observed initial decrease in off-flavor, is probably due to the occurrence of an off-flavor that is not of the same character as that exhibited in the earlier stages. The flavor has a bitter character which is commonly associated with overmature peas, even in the raw state.

Maturity, Yield, Skin Texture, and Off-Flavors

It has been suggested that grassy, stale, or rancid odors and flavors, sometimes experienced with cooked frozen peas, are associated with maturity of the raw material. Unfortunately young peas exhibit this type of deterioration to a greater extent than older peas. In fancy garden-run peas, the younger peas contribute in a large measure to this off-flavor. If peas with more tender skins were available, or if the skins could be tenderized, then fancy peas could be packed from more mature lots with less tendency toward off-flavor. Neilsen and coworkers[20] have shown that it is possible to blanch in a solution containing sodium hexametaphosphate and thus tenderize the skins sufficiently to accomplish this effect. There would be an added advantage in nutritional value if more mature material could be used in a fancy pack, since peas increase in fat, protein, starch, and other solids content with maturity.

Objectionable skin texture has been shown to be associated with maturity. Skin texture becomes objectionable when starch content of the product has reached 2.9 percent (Fig. VI). On the other hand, cotyledon texture passes the stage of fancy quality at 4.6 percent starch content (Fig. III). This observation suggests that skin texture becomes undesirable at an earlier stage than texture of cotyledon. If new varieties could be developed in which the skin toughens less rapidly with maturity, the crop could be harvested at a later stage than is now possible.

The manner in which maturity, as estimated by tenderometer, influences the yield of different grades of frozen peas is shown in Fig. XIV. This figure represents averages of the yields of five varieties grown in Washington. The upper curve shows average total (field-run) yields at various tenderometer readings. The three lower curves show yields to be expected of fancy, extra standard, and standard peas at various field-run tenderometer readings. These curves were obtained from tenderometer readings of a weighed lot of peas from a known area of land and from grading them into sizes one to seven. The weight and tenderometer reading for each size were then obtained. Any size having a tenderometer reading of 100 or lower was classed as fancy, 101 to 130 as extra standard, and 131 to 160 as standard; these were somewhat arbitrary classifications for the three grades.

(*Continued on page* 204)

Spray Dried Whole Eggs Improved With Carbohydrates

Carbohydrates, added to whole egg before spray drying, exert a protective effect during drying and retard deterioration in storage. Eggs thus treated produced satisfactory baked goods after months at 100 degrees F.

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WHETHER or not spray-dried whole egg, found to be very useful during the war, will have a permanent future market depends to a great extent on the retention of flavor and cooking qualities during dehydration and after storage. Most products made from dried eggs, such as baked custards, scrambled eggs, popovers, mayonnaise and plain cake, compare favorably with similar products made from shell eggs. Only sponge cakes, which depend upon foaming power, are difficult to prepare from dried egg.

When stored below 60 deg. F., dried whole egg with 3 to 5 percent moisture maintains its initial cooking quality for 6 months or longer.[1] When stored at high temperatures, however, it darkens rapidly, becomes less soluble, and acquires a storage flavor; simultaneously losing its ability to thicken and emulsify. It seems desirable, therefore, to develop new methods in processing which might improve the initial quality of dried egg, and retard deterioration under more severe storage conditions.

There is evidence that carbohydrates can exert a protective effect on egg during the drying process and retard deterioration during storage. Brooks and Hawthorne,[2] in treating egg pulp with carbohydrates, found that 10 percent lactose, sucrose, dextrin, and gum arabic, respectively, retarded denaturation of the protein when stored at 117 deg. F. Smaller carbohydrate molecules had either no protective effect or increased the rate of denaturation. The aerating power was greatly increased by the addition of lactose or sucrose before spray-drying. Pearce, Woodcock, and Gibbons[3] tried to retard deterioration by the addition of a number of substances before dehydration. They found the addition of 15 percent sucrose to be more effective in inhibiting fluorescence development at 75 than at 99 deg. F., and to have no effect at 118 deg. F.

Present Study

The present study was a part of the Coordinated Dried Egg Research Program of the National Committee on Poultry Products Research, participated in by industrial, college and governmental laboratories. It was undertaken to investigate further the influence of carbohydrates on the physical and chemical properties, cooking quality and flavor of spray-dried whole egg, and on the retention of these qualities during storage. The physical and chemical properties studied were fluorescence, solubility, and pH. To test a variety of functions of egg, or qualities that it must impart in general cookery, the product was used in popovers, baked custard, foams, and sponge cake. Flavor was tested in scrambled eggs and baked custards.

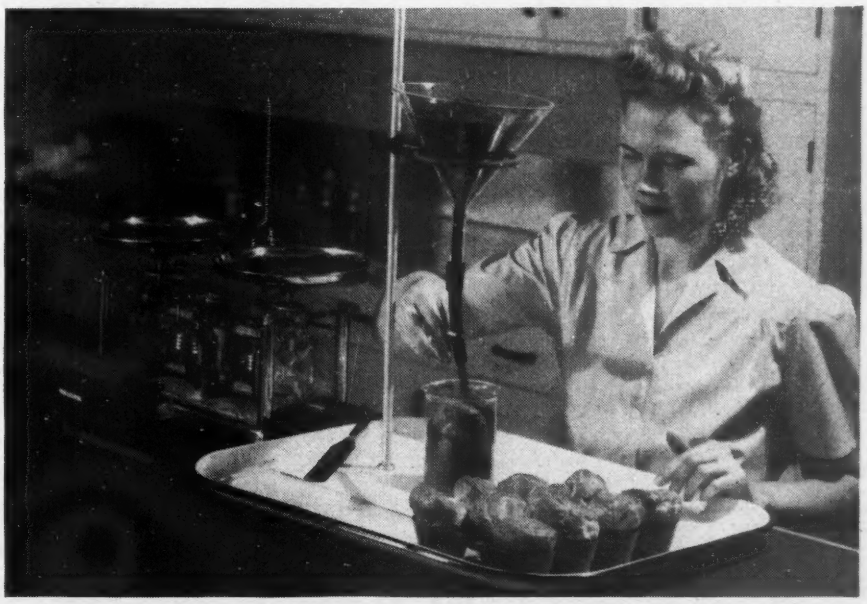


Fig. 1. Determining the volume of popovers by the seed displacement method.

*Now with Harvey and Howe, Inc., Chicago, Ill.

**The authors wish to acknowledge the laboratory assistance of Marylee Duehring.

TABLE I—Composition of Dried Whole Egg Samples

Addition to egg before dehydration	Moisture percent	Fat percent	Protein (Nx6.25) percent	Ash percent
Untreated	5.58	43.07	44.38	3.68
10 percent sucrose	4.40	14.79	33.94	2.82
20 percent sucrose	4.03	19.40	25.03	2.86
10 percent lactose	4.88	31.54	33.53	2.86
10 percent invert sugar	5.55	26.12	41.74	2.98
10 percent light dextrin	6.11	31.18	31.66	2.64
10 percent dark dextrin	5.89	31.68	32.38	2.65

TABLE II—Fluorescence of Carbohydrate-treated Spray-dried Whole Eggs

Addition to egg before dehydration	Fluorescence of ½ g. defatted powder after storage at 100 deg. F. for— 0 week	1 week	4 weeks	8 weeks	16 weeks
None	11.5	18.5	42.0	59.0	75.0
10 percent sucrose	8.5	10.3	22.0	26.0	44.0
20 percent sucrose	12.0	14.0	20.5	26.0	36.0
10 percent lactose	10.8	12.5	16.5	21.0	26.0
10 percent invert sugar	20.3	28.0	38.0	55.0	67.0
10 percent light dextrin	9.5	14.3	29.5	47.0	53.0
10 percent dark dextrin	17.0	23.0	28.0	49.0	53.0

TABLE III—Solubility of Carbohydrate-treated Spray-dried Whole Eggs Stored at 100 deg. F.

Addition to egg before dehydration	Percentage of nitrogen soluble in 10 percent KCl after storage for— 0 week	1 week	4 weeks	8 weeks	16 weeks	32 weeks
None	99.10	80.13	80.71	67.51	42.47	34.96
10 percent sucrose	97.94	95.93	83.72	79.85	73.91	72.34
20 percent sucrose	97.90	95.52	94.29	92.96	84.58	48.83
10 percent lactose	97.54	97.32	94.13	94.89	82.92	73.16
10 percent invert sugar	96.01	96.73	83.86	72.88	52.64	47.67
10 percent light dextrin	86.94	85.71	78.48	73.12	60.09	52.99
10 percent dark dextrin	87.22	85.05	79.32	74.98	64.51	56.85

TABLE IV—pH of Carbohydrate-treated Spray-dried Whole Eggs Stored at 100 deg. F.

Addition to egg before dehydration	pH after storage for— 0 week	1 week	4 weeks	8 weeks	16 weeks
None	7.29	7.43	6.95	6.80	6.75
10 percent sucrose	7.83	7.70	7.28	7.20	6.80
20 percent sucrose	7.58	7.68	7.20	7.05	6.93
10 percent lactose	7.70	7.53	6.95	6.95	6.80
10 percent invert sugar	7.35	7.16	6.78	6.50	6.35
10 percent light dextrin	7.10	7.30	6.98	6.65	6.45
10 percent dark dextrin	7.40	7.20	7.30	6.75	6.60

Experimental Procedure

Samples were obtained from a cooperating processing plant. They had been prepared by the addition before dehydration of 10 and 20 percent sucrose, 10 percent lactose, 10 percent invert sugar, 10 percent light dextrin, and 10 percent dark dextrin. In drying, an outlet temperature of 160 deg. F. was used for all experimental lots, including an untreated control lot. The dried eggs were vacuum-packed under nitrogen in tin cans and stored at 100 deg. F. for 1, 4, 8, 16, and 32 weeks.

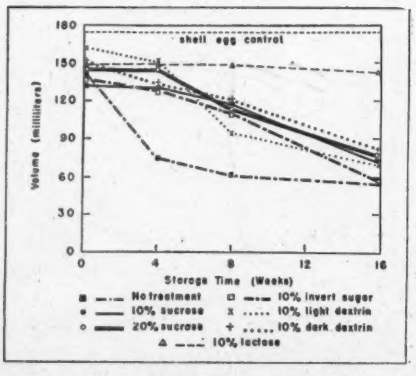


Fig. 2. Volume of popovers made with carbohydrate-treated spray-dried whole eggs stored at 100 deg. F.

Properties

Chemical composition, including moisture, fat, protein, and ash are given in Table I, as determined by methods of the Association of Official Agricultural Chemists,[4] before storage of the samples. At the end of each storage period, solubility in 10 percent potassium chloride was determined using the method of Bate-Smith, Brooks, and Hawthorne,[5] fluorescence by the method of Pearce, Thistle, and Reid,[6] and pH with a glass electrode.

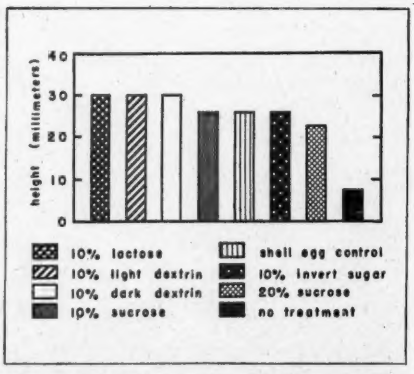


Fig. 3. Height of baked custards made with carbohydrate-treated spray-dried whole eggs after 32 weeks in storage at 100 deg. F.

Baking

As a measure of the baking quality, popovers were prepared from a standard formula which was adjusted for each sample of dried egg so that the protein content of all samples would be the same regardless of the amount of carbohydrate present. Each batch made five popovers which were baked in a household range oven. Volume of the popovers was measured by a seed displacement method, see Fig. 1.

To study coagulating ability, height measurements were taken on baked custards in an inverted position after removal from the 50 ml. beakers in which they were baked. In preparing them, a standard formula with a minimum amount of salt and sugar and no added flavoring was used. This formula was adjusted to the amount of sugar or dextrin contained in the dried egg.

Foaming

A beating test in which the specific gravity of the foam was determined served as a measure of foaming power. An adaptation of the method developed by Bennion, Hawthorne, and Bate-Smith,[7] and modified by the Western Regional Research Laboratory of the Department of Agriculture was used. Work was done in an air conditioned room with the temperature varying from 74 to 77 deg. F. and relative humidity from 32 to 59 percent. The amounts of dried egg and sucrose used were adjusted to allow for the sugars and dextrins contained in the experimental samples. To prepare the control, 27 g. of dried egg, 79 g. of distilled water, and 80 g. of sucrose were beaten 3 min. in a Waring blender, then transferred to a mechanical beater and whipped 10 min. at high speed. Weight and volume of the foam were recorded for calculation of specific gravity.

As further indication of the foaming power, sponge cakes were made from the egg-sugar foams. Forty g. of cake flour and 1 g. of sodium chloride were folded into 150 g. of the egg-sucrose foam. One hundred and eighty-five g. of batter were baked 25 min. at 350 deg. F. in a household range oven. The cakes were inverted on a rack, and after 48 hr. the volume was determined by the seed displacement method.

Taste

For flavor determinations, 40.5 g. of dried egg were mixed with 103.5 g. of distilled water in a 400

ml. beaker, and coagulated to a typical scrambled egg consistency in a hot water bath held a 194 to 203 deg. F. Baked custards for flavor determinations were prepared as described for coagulating ability.

Flavor was evaluated by a group of tasters using sensory methods. The samples were presented to the tasters one at a time in individual 50 ml. beakers, labeled with a code. A total of six samples were judged each day at 11 a.m. The standard rating scale commonly used in dried egg judging, ranging from 10 for excellent flavor to 1 for very intense storage flavor, was employed. Score 6 was chosen as the lowest acceptable flavor score. Two known flavor samples were available at each tasting to serve as standards: (1) a fresh egg sample with a flavor score of 10, and (2) a dried egg sample diluted with fresh egg to a flavor score of 6.0. Experimental samples stored at 100 deg. F., and control samples for all treatments stored at 0 deg. F., were included in random order in the experiment. Scores of the control samples and of the flavor samples presented to the judges as guides were pre-established by experienced tasters, who had calibrated their scoring system by comparison with dried egg samples of known histories received from other laboratories.* These tasters were not members of the regular panel, since they were aware of the identity of the experimental samples. Out of the seven tasters eligible for the flavor study, a small panel of tasters was selected for their reliability and validity on the basis of a control chart analysis. The results on the experimental samples are based on the scores of the panel so selected.[8]

Results and Discussion

That the presence of carbohydrates apparently inhibited the development of fluorescing substances is suggested by the results tabulated in Table II. Ten percent lactose- and 10 and 20 percent sucrose-treated samples showed the lowest fluorescence values after 16 weeks' storage at 100 deg. F.

Spray-dried whole egg, treated with 10 percent lactose and with 20 percent sucrose, showed very little change in solubility during storage

*Dried egg samples with known histories were received from Dr. George F. Stewart, formerly coordinator of the Dried Egg Research Program of the National Committee on Poultry Products Research, and from Mildred Boggs, Western Regional Research Laboratory, Albany, California.

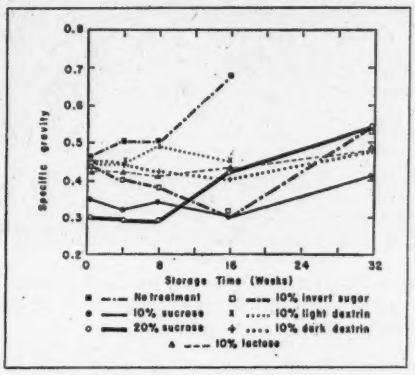


Fig. 4. Specific gravity of egg-sugar foams made with carbohydrate-treated spray-dried whole eggs stored at 100 deg. F.

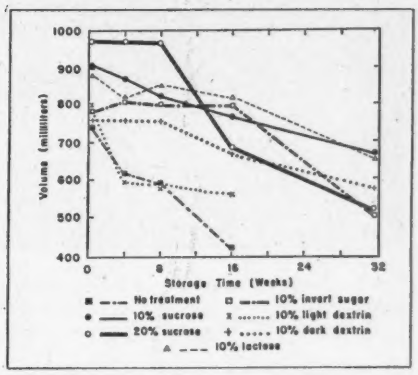


Fig. 5. Volume of sponge cakes made with carbohydrate-treated spray-dried whole eggs stored at 100 deg. F.

for 8 weeks, see Table III. After 16 weeks, the lactose sample and the sample with 20 percent sucrose had the highest solubility. No explanation was found for the marked decrease in solubility of the 20 percent sample after 32 weeks of storage. The samples with 10 percent sucrose and 10 percent lactose retained good solubilities after 32 weeks' storage. All other samples had good initial solubility but rapidly became less soluble after storage at 100 deg. F.

A slight increase in acidity occurred during storage, but the carbohydrate treatment apparently had no influence upon the rate of change in pH, see Table IV.

Baking Quality

All freshly prepared experimental dried egg samples made satisfactory popovers, see Fig. 2, although the presence of added carbohydrate decreased the volume slightly in comparison with those made with fresh shell egg. Volume was greater initially for the treated samples than for the untreated, and after 4 weeks' storage at 100 deg. F. the beneficial effect of the carbohydrates became increasingly evident; the treated samples then had popover volumes of 128 ml. or above as compared with only 74 ml. for the untreated sample.

After 8 weeks in storage, the lactose-treated sample maintained a size of 148 ml., while popovers made with 10 percent sucrose- and dark-dextrin-treated egg had decreased to 120 ml. The remainder made popovers with volumes below 120 ml. that were considered too poor for serving. After 16 weeks, only the lactose-treated sample was able to produce a satisfactory product. Considering color, texture, and moistness as well as volume, the relative value of the various carbohydrates for protection of the baking quality of dried egg during storage may be ranked as follows: 10 percent lactose, 10 percent sucrose, 10 percent dark dextrin, 20 percent sucrose, 10 percent light dextrin, and 10 percent invert sugar.

The correlation between the volume of popovers and fluorescence was extremely high with a coefficient of –0.98. As fluorescence increased, baking quality as measured by volume decreased. The volume of a popover is dependent chiefly upon the quality of the protein; hence, it is possible that the fluorescence test measures the deterioration in the protein material which is responsible for the loss of the baking quality. The correlation of volume of popovers with solubility, 0.79 and pH, 0.66, was significant but not as high as with fluorescence.

Coagulating Ability

Treatment with carbohydrates had a favorable effect on the retention of the coagulating ability or thickening power, but failed to prevent the formation of an undesirable surface crust in baked custard; with dried egg stored 8 to 16 weeks at 100 deg. F. this crust rendered all the samples unpalatable. Retardation of this crust-forming characteristic was apparently effected to some extent by 10 percent lactose and by 20 percent sucrose. These carbohydrates also retarded the development of a mottled tan color in the body of the custard, a condition which appeared within 4 weeks in the untreated samples. Baked custards made with any of the carbohydrate-treated eggs stored for 32 weeks at 100 deg. F. maintained the same height measurement as they had initially, whereas baked custards made with untreated egg showed no evidence of coagulation and were soft and watery, see Fig. 3. Taking all fac-

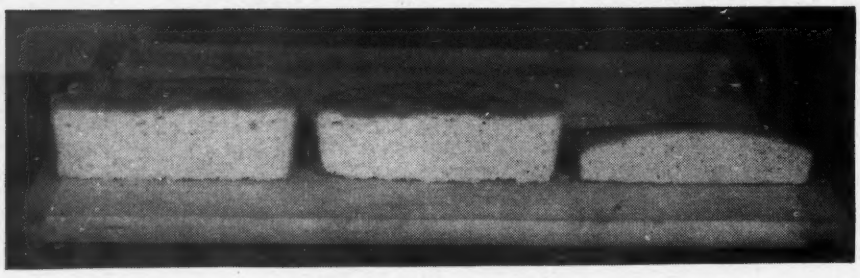


Fig. 6. Comparison of sponge cakes made with shell eggs and with treated and untreated spray-dried whole egg before storage. From left to right: (1) Shell egg, (2) dried whole egg treated with 20 percent sucrose, (3) untreated dried whole egg.

tors into consideration, the lactose-treated sample stored at 100 deg. F. could be used for making custards for as long as 16 weeks and the 20 percent sucrose sample for 8 weeks. All others were undesirable for this use after storage for 8 weeks, irrespective of their flavor scores.

Foaming Power

One of the important results of the addition of carbohydrates was the improvement in foaming power, a quality which is usually lacking in spray-dried eggs under ordinary conditions. Egg-sugar foams made from samples containing carbohydrates had lower specific gravities, in general, than did the untreated samples, see Fig. 4. Although the results are variable and do not permit fine distinctions among the various treatments, the following observations seems worthy of note: At the beginning of the experiment, the lowest specific gravity, 0.30, nearly equivalent to that of foam from fresh shell egg, was obtained with the sample containing 20 percent sucrose. Egg with 10 percent sucrose was next best in foaming properties with a specific gravity of 0.35. Ten percent lactose, invert sugar, and dextrin, respectively, did not improve the initial foaming power appreciably; all had specific gravities above 0.40. After storage for 16 weeks the sample with 20 percent sucrose showed a marked loss in foaming power, having a specific gravity of 0.29 at 8 weeks and 0.42 at 16 weeks. After 32 weeks none of the dried egg samples was capable of producing good foam.

Sponge Cake

The results on sponge cakes made from these foams are even more variable, probably because of the difficulty of control of the additional manipulative and environmental factors involved in mixing and baking. The volume of sponge cakes made from the egg-sugar foams showed a fairly high inverse relationship to the specific gravity of the foams, with a correlation coefficient of –0.86. Foams with large volume and low specific gravity, as obtained from fresh shell egg and from dried egg incorporating 20 percent sucrose, resulted in light sponge cakes with good volume, see Figs. 5 and 6. The 10 percent sucrose foam, which had a slightly higher specific gravity, had a lower cake volume than the 20 percent sucrose sample. Fair cake volumes were obtained from the lactose-treated sample, and poor cake volumes from untreated dried egg and that treated with invert sugar, light dextrin, and dark dextrin.

The relative value of the various carbohydrate treatments for making sponge cake remained the same after storage at 100 deg. F. as before storage with one exception—the good cake-making quality of dried egg treated with 20 percent sucrose was lost after 8 weeks. All of the experimental samples became dark in color, and acquired a burnt odor and taste which other ingredients present in the cake mixture were not capable of masking. Regardless of their foaming power, therefore, these samples would not be suitable for use after 16 weeks' storage at 100 deg. F.

It is not known what factors or components are responsible for the foaming characteristic. The solubility of the egg protein was not related to the foaming power, since the untreated sample initially had as high solubility as the sample treated with 20 percent sucrose, but was unable to foam. Likewise, all treated samples had high initial solubility but not all were capable of foaming. Similarly, fluorescence values were low for all initial samples; thus, fluorescence is not related to the foaming characteristic. At present this property can be determined only by a laboratory beating test.

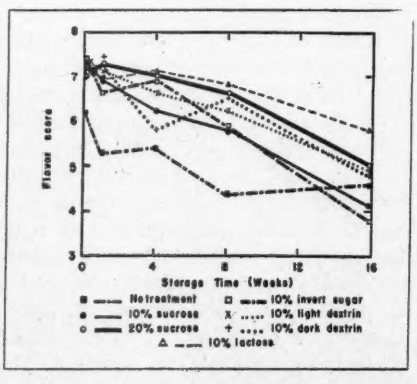


Fig. 7. Flavor scores of scrambled eggs made with carbohydrate-treated spray-dried whole eggs stored at 100 deg. F.

Flavor

The tasters preferred to test the carbohydrate-treated eggs in a sweetened product such as baked custard, but due to the large dilution with milk it was difficult to make taste analyses on storage flavor development. For this reason, treated eggs were tested in scrambled form after reconstitution to the water content of shell eggs. This resulted in an unacceptable product for table use, but served the laboratory purpose as a good medium for the detection of storage flavor.

In some cases it was necessary for the tasters to discriminate between storage flavor and sweet or other flavor contributed by the added substance. The keener tasters were able to do this without much difficulty,[8] while others felt that the caramel flavor of invert sugar, and the cereal flavor of the dextrins interfered with the detection of storage flavor.

Based on the average results of the panel selected by the control chart method,[8] the addition of any of the carbohydrates used in this study improved the initial flavor rating of the dried egg, and delayed the development of storage flavor when held at 100 deg. F., see Fig. 7. When tested in scrambled eggs before storage, the treated samples were more desirable, with flavor scores between 6.8 and 7.4, as compared with a score of 6.0 for the untreated sample. After storage, 10 percent lactose and 20 percent sucrose were more effective than the other carbohydrates in maintaining a desirable flavor. Dried egg treated with 10 percent lactose maintained a flavor score above 6 for 16 weeks; with 20 per cent sucrose for approximately 10 weeks. Treatment with 10 percent sucrose was inferior to both the 10 percent lactose and 20 percent sucrose, as were also the remainder of the treatments.

Spray-dried eggs, to which 10 and

(*Continued on page* 218)

EDITORIALS

LAURENCE V. BURTON, Editor

Our New Foreign Policy

PRESIDENT TRUMAN'S much discussed message to Congress about aid to Greece and Turkey has the timid souls aghast. Though it can be interpreted as a threat to peace, it is the only course that carries any hope of peace. By this time, even the most isolationist of minds should have learned that meekly minding one's own business does not guarantee peace. All that it guarantees is certain defeat to the nation that waits long enough for aggressors to gobble up every other nation.

Nobody in the United States of America wants war with anybody. Only a vigorous warning to encroachers on freedom can, however, avert a condition developing when war may be thrust upon us. The new policy deserves everyone's support. Only by making it a success can serious future trouble be averted.

Supreme Court Decision

IT seems like old times again when the Supreme Court renders decisions that meet popular approval. After the decisions in the United Mine Workers injunction case, even the most arrogant must realize that we are returning to a government by laws—not by men.

Much of the moral wreckage of the New Deal remains to be cleared away, but a gratifying start has been made.

Red Ink Is Poison

PROCESSORS who cut the corners on frozen food quality during the war and got away with it are now having their troubles, although there are many distributors who also must be unhappy—if one reads their financial statements correctly.

One of the distributors, whose sources of supply have not always been synonymous with top quality, has recently published a report showing losses running into six figures, whereas a modest profit had been made in the last year of the war. This ties up with plenty of rumors around the trade. It seems to mean that such buyers are not going to handle any more "near quality" frozen foods.

Strength of character is one of the greatest attributes of management in the production of frozen foods. Many who lack it have thrown away a wonderful opportunity. But it is never too late to begin hewing rigidly to the line of good quality. It cost plenty of millions of dollars for Birdseye to create a good reputation for frozen foods. Everybody could have ridden along on that reputation, without paying much of the pioneering cost, had they elected to do so. Too many, however, saw a chance to cut corners, save on production costs and the expense of quality control, because during the wartime scarcities almost anything could be sold. They are sadder and wiser now. Cutting the corners has not paid.

Those Price Declines

A NOVEL attitude towards precipitate price declines has been expressed by a wise merchandising individual who has had as much reason to suffer as anyone from the events that took place at the turn of the year.

He is glad they occurred that way because it is all over at once. Furthermore, when prices are melting away slowly nobody buys anything anyway because all that people have to do is wait a few days or weeks to get a better price. The better idea, he continued, is to get down to rock bottom right away, rebate the price decline to the customers, and then begin to work up from the bottom until a point is reached where the goods go into consumption as fast as they are produced. In his philosophy it is well nigh impossible to work from the top price down and reach the sound price without waiting many more months than is necessary or economic.

The only drawback to applying his principles seems to lie in the need for adequate resources with which to rebate to customers who have unsold stocks on hand. All too often the precipitate decline catches manufacturers in a position where most of their cash resources are tied up in goods in the warehouse.

Weather Control?

SPEAKING of the weather, some months ago Brig. Gen. David Sarnoff, Pres. of R.C.A., asserted publicly that "Man may learn how to deflect air movements with consequent changes in weather and he may discover how to neutralize a storm or detour it from its course."

Far be it from us to take issue with David Sarnoff, but one wonders if he has any concept of the magnitude of the task?

A high pressure area is more important to the food industries than the storms in a low pressure area, for high barometric pressure brings clear, cool air and killing frosts if it occurs during potentially dangerous seasons of spring and autumn in the northern states. While killing autumn frosts have often been most destructive of growing raw materials, they are not always regarded as an evil by the processor. The pickle crop of 1946 would have been burdensomely large had it not been for an opportune frost.

A high pressure area is really a "mountain" of cold air, sometimes very cold, weighing millions of tons and sometimes moving at incredible speed.

About 15 years ago one of them moved from Alaska to the Mississippi Valley about as fast as an airplane of that day could fly. Such a cold area may be large enough to cover several states.

By the formula, that Force = Mass × Acceleration, one can calculate the immense force that would be needed to deflect such a moving body of cold air. The sun can do it, and normally does it two or three times a month. But the amount of the sun's radiant energy intercepted by the earth is generally regarded as about 10,000 times all the energy under the control of man.

Maybe atomic energy could do it but the by-products of such an attack on weather might make a killing frost far preferable.

Synthetic Glycerine

A NEW plant, to make glycerine by organic synthesis, is announced by Shell Oil Company. This makes at least three competitors to natural fats as a source of glycerine, the others being (a) the old method of deriving it from distillery slop as a by-product from yeast fermentation and (b) a method of hydrogenating cellulose in sawdust developed in Germany. Rumor has it that starch can also be hydrogenated to glycerine, but apparently the Patent Office is temporary custodian of the facts.

All such competition to fats introduces new economic factors into the markets for recovered waste fats and vegetable oil refiners' foots. Method (a) is really a salvaging operation, usually forced by laws prohibiting stream pollution. Method (b) is definitely a high cost method born of wartime necessity. Shell's glycerine is to sell at about 19 cents a pound f.o.b. Houston, Texas, and is said to be intended for use in alkyd resins.

Carbonated Drinks per Capita

SOME interesting figures were recently presented by John J. Riley, Secretary of American Bottlers of Carbonated Beverages at the Massachusetts Bottlers Association.

During the war years the industry produced an average of 18,000,000,000 bottles of carbonated beverages a year. This, according to Mr. Riley, averaged 130 bottles per person per year despite the sugar shortage, but includes the sales to the Armed Forces.

To portray the competitive market, he calculates that "almost everyone drinks tea or coffee two times a day," making an estimated 728 drinks a year per person.

Admittedly the age brackets for carbonated beverage consumption are much lower than for coffee or tea. If we were computing the potential market for carbonated beverages we would omit children under 5 years; and, for the market for tea and coffee, we would omit children under 15. Since there are about 130,000,000 persons over 5, it is more informative to up Mr. Riley's consumption figure to 138 from his 130 based on 140,000,000 population. (Most parents have enough trouble burping their infants without added CO_2.)

One does not, however, shade his tea and coffee observation except to note that there are about 110,000,000 persons over 15 who probably drink these stimulants for the remainder of their lives. But they begin to omit sugar and cream as they grow older.

It is a curious trait of humanity that its taste for sweets tapers off at from 40 to 50. Probably this characteristic accounts for the fact that carbonated beverages are more popular with the young than the aged.

Who's Dead On His Feet?

DURING an animated discussion of the engineering of a certain food process, the statement was made that the engineers who specialize in that field were not alert, that the procedures were "exactly the same today as fifty years ago."

"Dead on their feet" is a complaint too often heard from people in the food processing industry and, in our opinion, it is not justified. To make that statement is not to defend the equipment builder, but to point out that if the equipment builder fails to invent something new with sufficient frequency to please the men in the food industry, there is nothing to prevent the latter from doing a bit of inventing on their own. Or, if the food processor does not want to enter into the field of mechanical research, then let him take his ideas, if any, for improvements to the equipment builder and demand that they be incorporated in designs.

Another step is a possibility: the food production man can state his problem vigorously to the builder and ask for a solution.

We have little admiration for a man who crabs because someone fails to come around with the solution to his problems. Progress consists of going after an objective, not waiting for the objective to come to him.

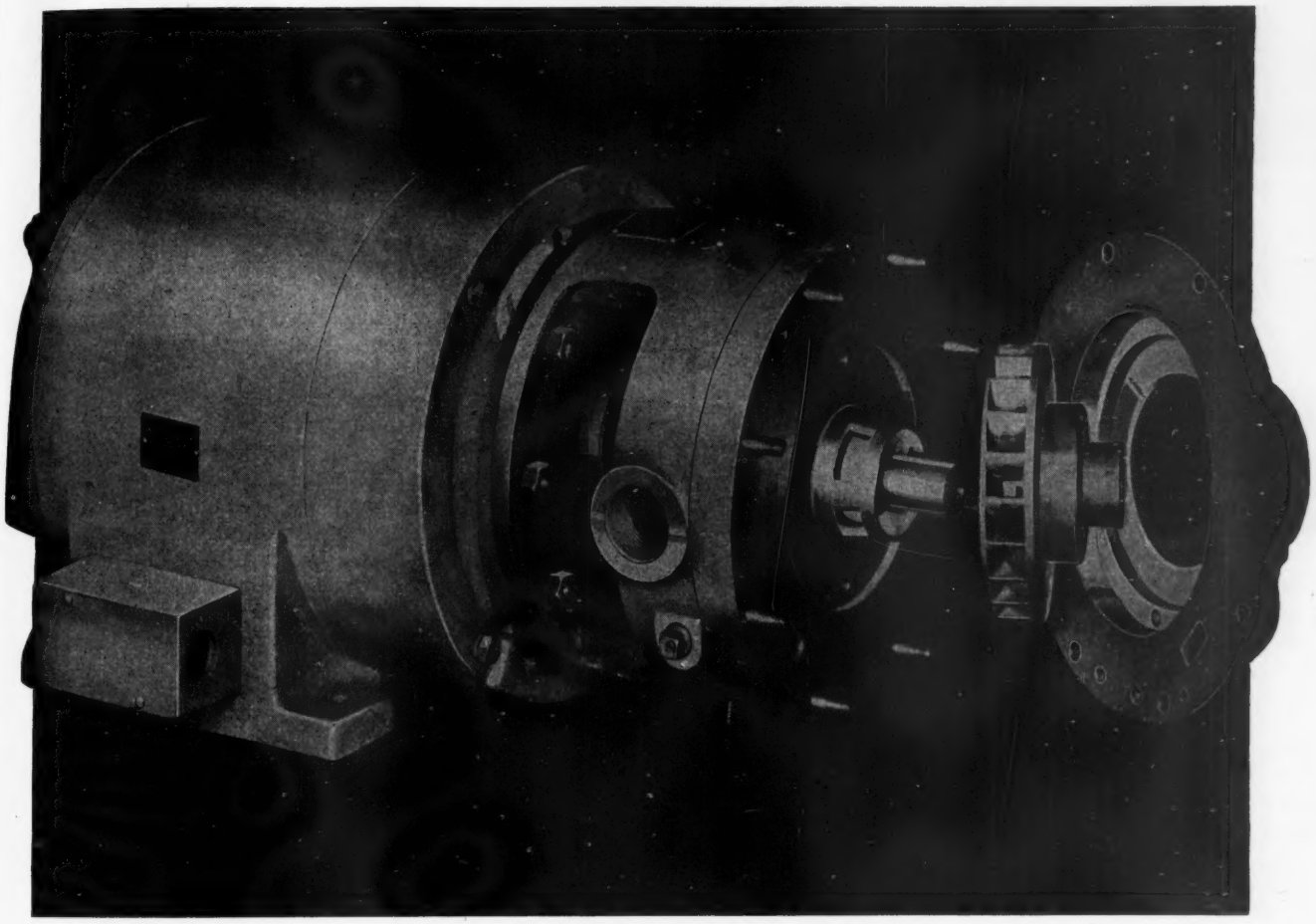
Salt Preservation of Tomato Paste

A METHOD of preservation of tomato concentrate that may be new to Americans has been used in Germany at the plant of Maggi G. m. b. H., Singen. To 40-percent tomato paste, produced at Parma, Italy, was added 15 percent of salt (NaCl). The salted paste was stored in concrete tanks 5x15x5 ft. at a temperature of about 62 deg. F.

From available information this material was used in Maggi sauce making due allowance for its salt content in the final product.

Presumably the combination of salt and normal acidity of the paste served to preserve it against spoilage. From this fragment of information it may be possible for American food technologists to adapt the procedure to domestic needs.

The Nash Clean-Air Compressor has but one simple moving part.



The Nash Clean-Air Compressor has but one moving part, cast in one piece and rotating in the pump casing without metallic contact. No internal lubrication is necessary; therefore air or other gas compressed with a Nash is entirely free from oil contamination.

Dust and heat are removed from the air, or gas compressed, by the unique Nash "Liquid Piston". Air from a Nash Compressor is therefore delivered free from dust, heat, or oil, without supplementary filters or air washers, in a perfected mechanical structure with no internal wearing parts.

Air or gas from a Nash Compressor may be used for agitating, blending, maintaining pressure on storage tanks, or moving liquids and materials by pressure displacement, in connection with the most delicate food, beverage, or chemical process, without danger of contamination.

Bulletin D-252 tells all about Nash Clean-Air Compressors, and it is free on request.

THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS

Canned Eggs

DRIED whole eggs are now available for civilian use in consumer as well as institutional size containers.

C. A. Swanson & Sons, Omaha, packs and distributes the product in 8 oz. and 3 lb. cans. The institutional size is gas packed and contains no more than 2 percent moisture. The retail size, containing a maximum of 5 percent moisture, is not gas packed.

When sugar becomes more plentiful, the company plans to use a new formula for sugared dried whole eggs.

A small recipe book has been prepared and is distributed with each can to help educate the consumer in the use of powdered eggs.

For Bakers

AN item for the bakery trade is King of Spuds Potato Flour, product of Potato Products Corp., Grand Forks, N. D.

Test runs of the flour have been completed and samples have been sent to many bakers throughout the country.

According to the company, the potato flour stimulates fermentation of the dough and improves flavor of bread, whether used in potato bread or, in smaller quantities, in white, rye or wholewheat breads.

Carl Feldhusen has been appointed sales manager for the company's flour division. It was Feldhusen who introduced potato flour to this country thirty years ago.

The flour is made with cooked potatoes rather than with uncooked dehydrated potatoes or potato starch.

A Blend

HYDROGENATED shortening, fresh eggs and milk have been processed together and spray-dried to produce a product called Egganene.

Packed in 150 lb. barrels, the product is being sold to blenders of cake, muffin, gingerbread, doughnut and sweet dough mixes. A complete dry mix is achieved by the addition of flour, sugar, salt and leavening.

Northwest Egg Mix Co., with sales offices in Chicago, is the manufacturer. Processing is done in Owatonna, Minn.

New Line

"ALWAYS GOOD TASTE" is the slogan with a double meaning chosen by Susan Baker Products, Inc., New York.

A group of staples and specialty foods, the Susan Baker line has been assembled in the past year and is being sold by the jobber-salesman method along the Atlantic Coast. The company aims at eventual national distribution.

All products except the dehydrated soup have been reserved for independent stores only, so that the independents will have a complete line of foods without chain store competition. The stores are serviced by individual salesmen who own their own Susan Baker trucks and who sell only Susan Baker products.

The line is being pushed by newspaper and radio advertising in localities where it is distributed.

The distinguished labels are French blue with white printing and traces of red. Many types of packaging materials are represented including glass, tin, transparent cellulose and waxed paper wraps and foils.

Represented under the Susan Baker name are such items as tea,

coffee, relishes, salad dressings, preserves, jams, maraschino cherries, sirups, molasses, prune juice, flavoring extracts, cookies and fruit cake, as well as dehydrated chicken noodle soup.

Choose Your Style

CONCENTRATED clam chowder has been added to the list of canned and frozen items of the 40-Fathom Division of General Foods Corp.

Base of the new chowder is the surf clam from waters off Long Island. The clams have been combined with onions, potatoes, vegetable oil, rice flour and seasonings. The product can be made into New England or Manhattan style chowder.

The label on the 15 oz. can is bright blue with an identification face of yellow and red.

Citrus Jell

FOR salads and desserts just chill and serve. That's fruit juice, jelled and flavored.

Product of Winckler & Smith Citrus Products Co., Anaheim, Calif., Anajell is made from pure undiluted California fruit juices, vacuum sealed and jelled in the tin. Flavors are orange, lime, lemon, butterscotch, strawberry and orange-almond.

It may be cut into 6 or 8 slices after chilling, or poured into a fancy mold and served with fruit

added. Ingredients are orange juice, natural or imitation flavors, USP gelatin and USP certified food color.

The can contains 1 pt. 2 fl. oz. The label is bright red and yellow with a white background setting off the pertinent facts on the face.

Noodle News

NEWEST product of National Specialty Foods Inc., New York, is "Servit" Noodle Sticks.

These French fried noodles are crisp julienne style. They are recommended for use with chow mein, chicken fricassee, steaks, chops; or they may be served with cocktails. Ingredients include flour, salt, whole eggs, starch, vegetable shortening and water.

Paksure
FOOD PACKAGINGS
The right type package for your product-designed by specialists
Glassine, Wax Glassine and Cellophane in Rolls and Sheets; Bags and Envelopes of Glassine, Wax Glassine and Cellophane.
WRITE FOR INFORMATION
PACKAGING DIVISION
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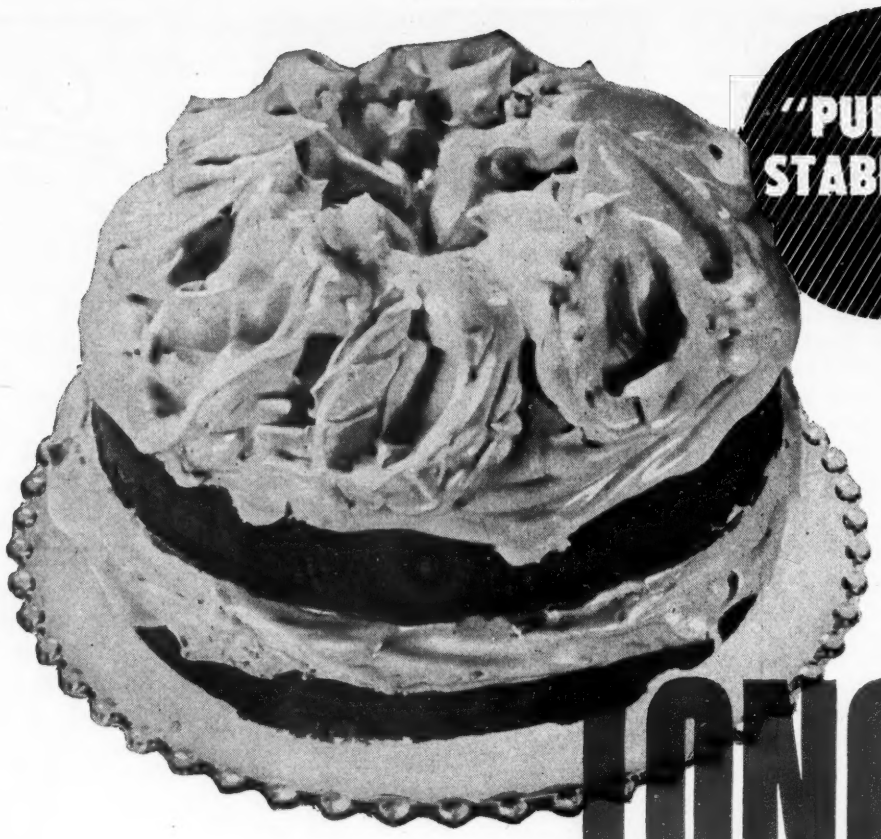


"PURITY" STABILIZER

LONGER SHELF LIFE

"PURITY" STABILIZER is a vegetable-type stabilizer that prolongs the shelf life of butter cream, meringue, marshmallow and whipped cream toppings—by protecting them against bakeshop temperatures. It replaces fat, gelatin and agar.

"PURITY" STABILIZER cooks to a free-flowing, translucent paste with a neutral taste. When added to many perishable frostings and toppings, it strengthens them and contributes to their glossy surface, fine-grained texture and moist tenderness.

Bakers who already have favorite toppings of their own will frequently be able to improve them with "PURITY" STABILIZER. Bakers who are now incorporating 2 to 3 ounces of "PURITY" STABILIZER in each pound of butter cream or icing made by their own formula are finding a remarkable improvement in sales appeal, eating quality and ease of handling. "PURITY" STABILIZER is another product of National's Food Laboratory research that has produced a specialty starch for every baking need.

National also produces: PURITY "FL" a superior starch thickener for fruit pie fillings with a soft gel, full fruit flavor and brilliant color; PURITY "C" a quality starch thickener for cream and fruit fillings; MELOJEL a double-refined corn starch; FLOJEL candy starches in all accurately controlled fluidities; PURITY GLAZE an oil-sealer for coating almonds; and PURITY "PWS" a complete salad dressing starch.

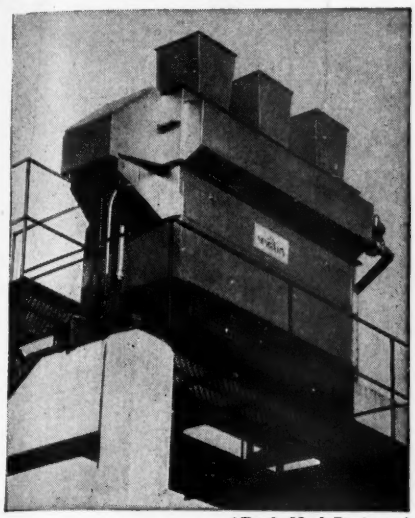
Offices: 270 Madison Avenue, New York 16; Boston, Philadelphia, Atlanta, New Orleans, Indianapolis, Chicago, San Francisco, and principal cities. In Canada: Meredith, Simmons & Co., Ltd., Toronto and Montreal. In Holland; Nationale Zetmeelindustrie, N. V. Veendam.

National STARCH PRODUCTS

STARCHES — *AND SPECIALTIES WITH EASILY DEMONSTRATED SUPERIORITY*

NIAGARA *AERO-PASS CONDENSER

With Oilout, Duo-Pass and Balanced Wet Bulb Control



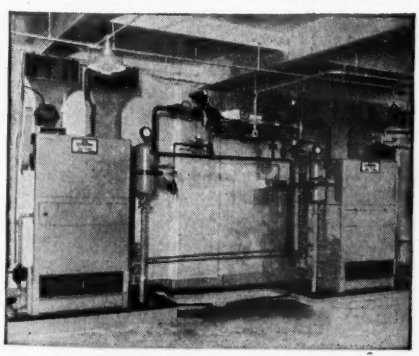
*Trade-Mark Registered

Increases refrigeration capacity and plant production. Saves power and water consumption. Essential exclusive features:

1. "Balanced Wet Bulb Control" holds compressor head pressure at the minimum—saving power.
2. "Oilout" prevents oil accumulation in refrigerant—assuring full capacity.
3. "Duo-Pass" precooling coil eliminates scaling of condenser coils—assures uninterrupted service at full capacity.

Write for Bulletin 101-FI

NIAGARA "NO FROST" METHOD of Refrigeration



With the NIAGARA "NO FROST" Method you always have full capacity with never any refrigeration loss from frosted coils.

Write for Bulletins 83-FI and 95-FI

NIAGARA BLOWER COMPANY

Over 30 Years of Service in Industrial Air Engineering

405 Lexington Ave., New York 17, N. Y.

Field Engineering Offices In Principal Cities

NIAGARA

AIR ENGINEERING EQUIPMENT

The noodles are packed 3½ oz. in a heat sealed transparent bag protected by a window carton with flap ends. Color design is red, yellow and blue.

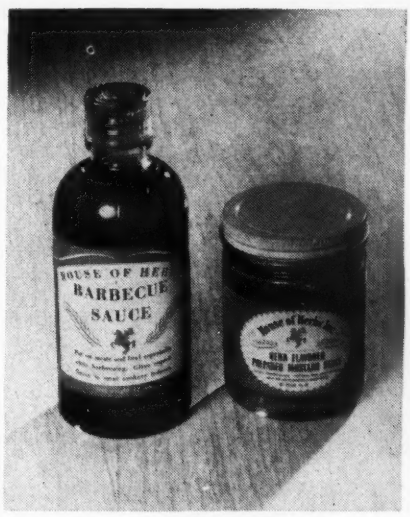
Sydney Smithline & Associates, New York, is the national sales representative.

This Is For Tots

IN consideration of the youngest generation, Gerber Products Co., Fremont, Mich., has produced another variety dish—Chopped Vegetables and Bacon with Rice.

Bite-sized particles of bacon are blended with carrots, green beans, potatoes and celery. Cooked rice adds the bulk, making it a complete meal.

Dried yeast in the formula provides B-complex vitamins. The 4¾ oz. size supplies one substantial serving.



For Ham What Am

HOUSE OF HERBS INC., Canaan, Conn., has introduced two concoctions for the gourmets.

House of Herbs Barbecue Sauce, spooned over ham while baking, lends the finishing touch that ham needs.

It is a blend of tomato, meat broths, herb vinegars, Worcestershire sauce, fresh herbs and spices, salt, peppers and benzoate of soda not exceeding 1/10 of 1 percent.

The company's Herb Flavored Prepared Mustard Sauce gives that added flavor to canapes, cold or hot meats, stuffed eggs, cheese dishes, salad dressings and sauces.

The product consists of prepared mustard combined with seven fresh herbs, broth, sherry, spices and sodium benzoate. It is especially recommended as a coating on ham during baking.

You Know it's Cooked when . . .

THIS SPOT TURNS *Green*

To eliminate the waste and embarrassment of uncooked goods in your plant, just place a Cook-Chex Retort Tag on each basket before cooking. Look at each tag before unloading. If tag is purple, food has not been cooked. If green, cooking has been completed. That's all there is to Cook-Chex. Simple, accurate money-saving. Price: $9.75 per M—less than 1/50¢ per case.

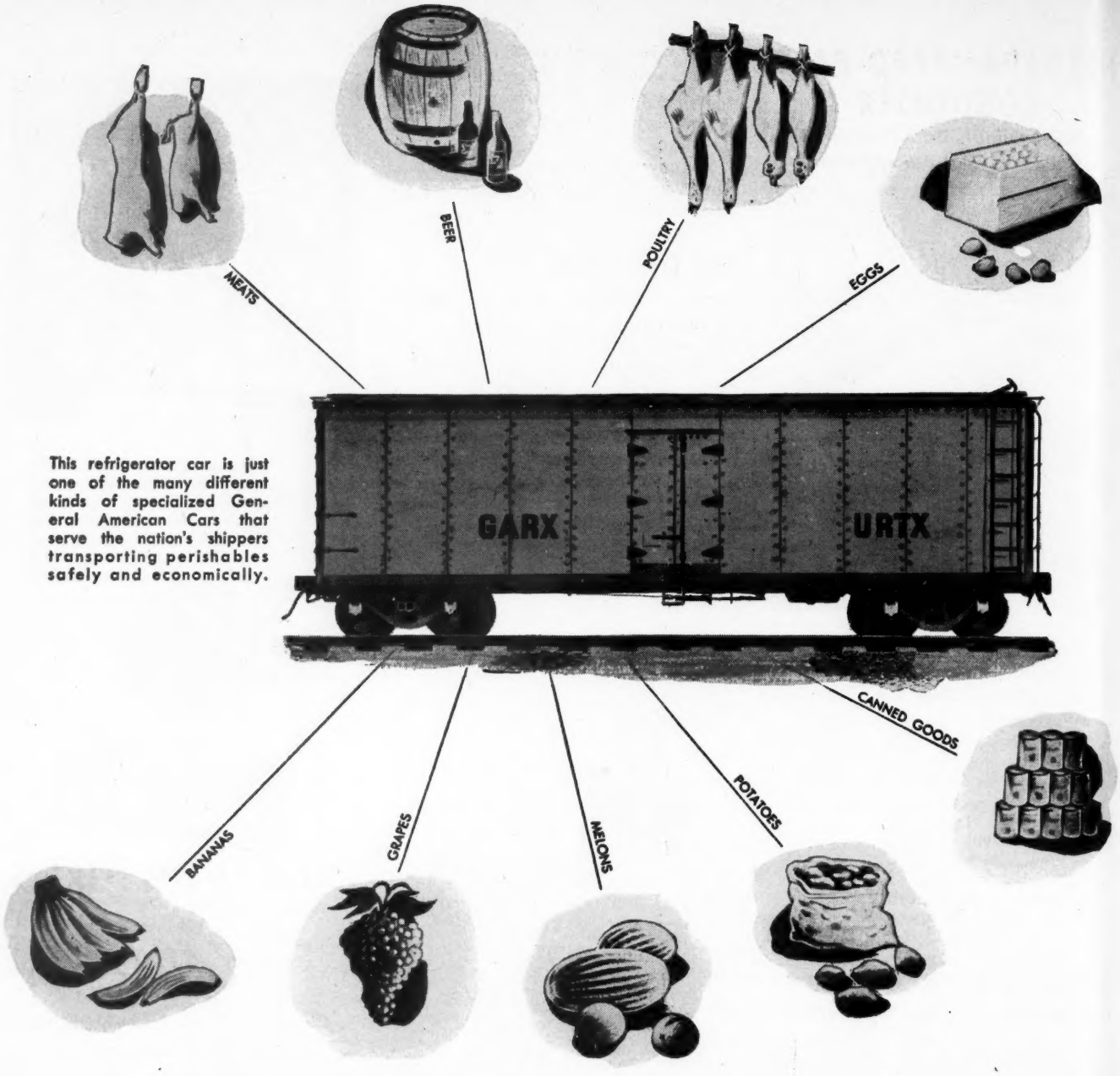
THIS METAL CONTAINER is a practical, sturdy holder for Cook-Chex tags. Write for FREE sample holder and tags, with complete facts and directions.

ATI COOK-CHEX

MANUFACTURED BY

ASEPTIC-THERMO INDICATOR CO.

4665 HOLLYWOOD BLVD. - LOS ANGELES 27



This refrigerator car is just one of the many different kinds of specialized General American Cars that serve the nation's shippers transporting perishables safely and economically.

GENERAL AMERICAN

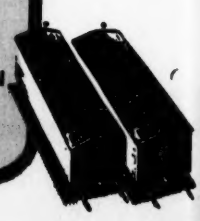
BUILDERS AND OPERATORS OF ALL TYPES OF REFRIGERATOR CARS FOR PERISHABLE GOODS

No matter what kind of perishable product you ship—milk or melons, beer or bananas—there is a General American Refrigerator Car that is tailor-made to fit your needs.

General American maintains an office in almost every producing area to place at your disposal able representatives whose job it is to help you solve your indvidual shipping problems . . . swiftly and economically.

Whenever you ship . . . whatever you ship . . . ship via General American, and realize the advantages of General American's nation-wide reputation for reliability and responsibility . . . a reputation built out of years of experience serving America's leading shippers.

UNION REFRIGERATOR TRANSIT LINES
MILWAUKEE
A DIVISION OF
GENERAL AMERICAN TRANSPORTATION CORPORATION
CHICAGO



FOOD INDUSTRY NEWS

GENERAL

OWMR Reports Progress Among Meat Packers on Annual Wage

Agency recommends full government assistance in achieving wage stabilization goal, but frowns on imposition by law

THE guaranteed annual wage is not going to be imposed on industry by law. However, assistance is given to those seeking information on the subject in a report to President Truman by the advisory board of the Office of War Mobilization and Reconversion.

Considerable progress toward an annual wage guarantee has been made in the meat packing industry, where guaranteed work-weeks have been in effect for some time. Most notable example is the plan in existence at Geo. A. Hormel & Co., Austin, Minn. (F. I. Nov., 1937, p. 628) whose board chairman, Jay C. Hormel, believes that guaranteed wages must result from, rather than cause, stabilized employment.

Tobin Packing Co., in its contract with the United Packinghouse Workers, CIO, agreed to a yearly guarantee for employees in its Fort Dodge and Esterville, Ia., plants, who have one year seniority.

The Big Four packers—Swift, Armour, Wilson and Cudahy—and some other employers having agreements with the CIO, did not sign a guarantee. However, they agreed to a policy statement recognizing the "importance and desirability" of an annual wage guarantee. Both the companies and the union are making independent studies as to the "practicability" of annual wage plans in the industry.

In transmitting the annual wage report to the President, the OWMR advisory board recommended that the subject of guaranteed wages be left to collective bargaining, rather than trying to pass a law. It pointed out that guaranteed wages or employment are valuable to the nation, employer and worker alike, "when suitably adapted to the needs and conditions of the industry or establishment."

"Employers and unions contemplating the introduction of such plans will derive from this report greater understanding of the benefits that may be gained, of the limitations and other factors to be considered, and of the mechanisms that may be utilized."

In other words, there are many pitfalls on the way to a guaranteed wage, and the OWMR's report will help management to acquaint itself with them.

American Home Drops Anhydrous Process

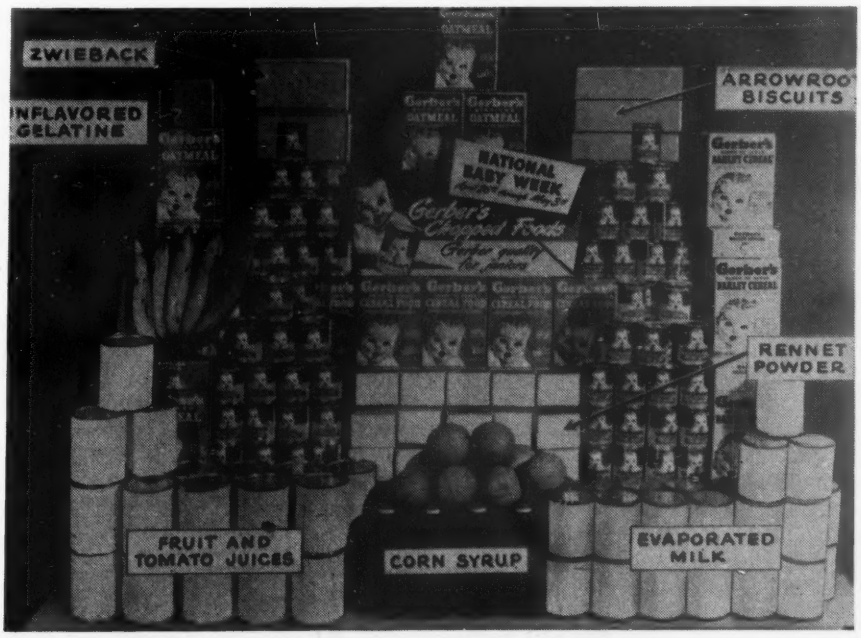
AMERICAN HOME FOODS has relinquished its contract with Clarence Birdseye for the anhydrous process of drying fruits and vegetables, which was introduced to the industry more than a year ago. Obstacles in immediately attaining the commercial success anticipated, which conflicted with the company's prearranged schedule of operations, are given as the principal reasons.

In a statement confirming the termination, H. W. Roden, president of American Home Foods, said: "After a reasonable period of investigation of the Birdseye process of anhydrating foods, we came to the conclusion that complete consumer acceptance and profitable commercial success of the process covering the entire field of garden fruits and vegetables, in which we were interested, were not as immediately attainable to us as originally anticipated. Accordingly, in view of our prearranged program of schedule operations and the existing conditions, we regretfully terminated our interest."

IFT Publication Makes Initial Appearance

Food Technology, the new quarterly publication of the Institute of Food Technologists, made its initial appearance early in March. Edited by C. Olin Ball, director of chemical research, Owens-Illinois Glass Co., the first issue carries ten of the papers presented at the 1946 IFT convention. There is also an editorial section and a section on transactions. This quarterly will replace the former Proceedings of the IFT.

Members of the Institute will automatically receive a copy of the publication, but the subscription list is not limited to members. Nonmembers wishing to subscribe are directed to write George J. Hucker, New York State Agricultural Experiment Station, Geneva, N. Y.



NATIONAL BABY WEEK

Baby foods move up front during the week of April 26 to May 3, and the promotion is not confined to those labeled "baby food." Here is a suggested display featuring some of the foods preferred by His Honor or by that person pushing things up on a spoon.

TEA TASTING TIME

New standards for tea imports were established at this gathering of tasters in New York City. Left to right are J. Grayson Luttrell, vice-president, McCormick & Co.; Robert A. Lewis, Standard Brands; George F. Mitchell, General Foods; Walter Hellyer, Hellyer and Co.; Paul Ahrens, Irwin, Harrison, Whitney; William Harrington, H. P. Thompson, Inc.; and Charles Hutchinson, Supervisor U. S. Tea Examiner.

American Home Head Moves to Los Angeles

H. W. RODEN, president of American Home Foods, Inc., is transferring his office and residence from New York to Los Angeles in a long-planned move to devote his attention to policy formulation and to augment the company's position on the west coast, according to an announcement by Walter F. Silbersack, president of American Home Products Corporation, the parent company. The firm already has a division sales office and five district sales offices in that region, in addition to a food producing plant at San Jose, California.

Mr. Victor T. Norton, recently appointed executive vice-president of the corporation will act as administrative head of the business and the headquarters will continue to be maintained at 22 East 40th Street, New York City. American Home Foods manufactures and distributes several nationally advertised food products.

Mr. Roden, while remaining president and director of American Home Foods and a vice-president of American Home Products Corporation, either has or will soon divest himself of many other positions he has recently held in associated companies and in the food trade. Among them are chairman and director of G. Washington Coffee Refining Co., director and chairman of the executive committee of Chef Boy-Ar-Dee Quality Foods, and president and director of three associate firms, Affiliated Products, Inc.; P. Duff & Sons, Inc., and Joseph Burnett Co. He has also recently been a director of Grocery Manufacturers of America, a director of the Association of National Advertisers and a member of the Advertising Council.

Weather Bureau Seeks Climatology Customers

THE weather bureau is looking for more customers in industry. It has something to sell, something new—a service which it calls industrial climatology. This consists of projecting long-range weather patterns that may influence plant location, building and product design and construction, and the distribution of goods.

A weather pattern is not a weather forecast. There is no attempt to forecast that there will be rain or snow on a certain day sometime in the future. A pattern is what the climatologist comes up with by analyzing historical weather information and determining the odds that a specific weather situation will occur during a given time interval. Over a long period of time weather conditions tend to repeat at a definite frequency.

Optimistic Outlook Raises Sugar Quotas

WITH its fingers crossed, the Department of Agriculture turned over a sharply increased sugar tonnage for rationing in the second quarter. This followed close upon the announcement of the International Emergency Food Council that the allocation of sugar to the United States, at the international level, was increased to 6,800,000 short tons raw value, an increase over the allocation of 1946 of 1,203,000 short tons. Sugar available for distribution in the second quarter amounts to 1,740,000 tons, up 355,000 tons from last year.

Industrial users will get a 25 percent increase in their second quarter ration. Bakers, bottlers, and candy manufacturers had their permitted use upped from 60 percent of the base period (usually the corresponding month in 1941) to 75 percent. Hardship adjustments already had been announced for industrial users who expanded their facilities to supply the so-called "exempt agencies" during the war. Such adjustments will be made on an individual firm basis for the most part. Preserve manufacturers will receive an increase to 75 percent of their base period use. Preservers have been receiving only 55 percent of their base period (1944).

Milk Canners

Manufacturers of bulk sweetened condensed milk did not have to wait until April for their increased ration to start. Beginning March 1 the percentage factor regulating their maximum allowances was increased to 110 percent of their base. This increase, says OPA, was made to take care of the period of flush milk production, but the condensers object that the increase is not enough.

Hotels, restaurants and other eating establishments get increased allowances in line with those granted to other non-household users. Inventory adjustments for wholesalers and retailers were held up until procedures could be worked out. The increased supplies will require additional stocks in the distribution system.

In making the increases, USDA officials are looking at the optimistic crop reports from Cuba, but remembering the loss of production amounting to 750,000 tons that occurred last year because of crop failures of varying proportions and the Hawaiian strike. There is also the matter of a possible strike in Cuba, which could upset all esti-

mates. Although the price Uncle Sam pays for the sugar is tied to the cost of living in the United States and thus to the cost of foodstuffs, lard, rice and flour, that Cuba imports from this country, prices field workers must pay are up to twice what the commodities should actually bring.

The food is finding its way into black market channels. Since the imports are government controlled, it seems obvious that nest feathering is going on in high places. At least this is the view of Cuban labor leaders, who are constantly urging their followers to strike action in protest of the situation.

This is behind the government's statement that "any major change in the program of significant reduction in the important sugar crops of 1947, below those now anticipated, could require reductions in the allocations later in the year."

Indiana Meat Packer Grants Union Increase

KINGAN & CO., INC., Indianapolis, Ind., meat packers, and Local 117, United Packinghouse Workers of America, CIO, have signed a contract providing for a 10-cent hourly wage increase for 2,000 employes of the company.

The terms of the contract were announced in February. The agreement is effective until August, 1948. Wage provisions of the agreement are retroactive to November, 1946.

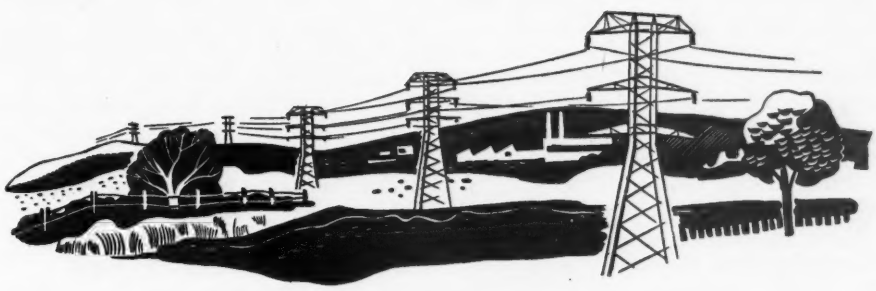
Basic hourly rate for men is 96 cents an hour, and for women, 85½ cents an hour.

House Organ Entries To Close April 25

HOUSE organ editors in the United States and Canada are again being urged to participate in the publications contest, sponsored by the International Council of Industrial Editors. This is the second contest of its kind and all company publication editors are urged to write for entry blanks immediately to Joseph A. Dragotto, PO Box 404, Milwaukee, Wis. Dragotto is editor of the Solar Corp. company magazine and is representing the Wisconsin Regional Association of the council. The association is conducting this year's contest. Deadline for entries is April 25, and all entries must be postmarked not later than midnight of that date.

The sponsors point to the advantages of such a contest in gaining an impartial appraisal for each publication. Every editor will be given his publication's rating.

Need **Ready** **Electric Power?**

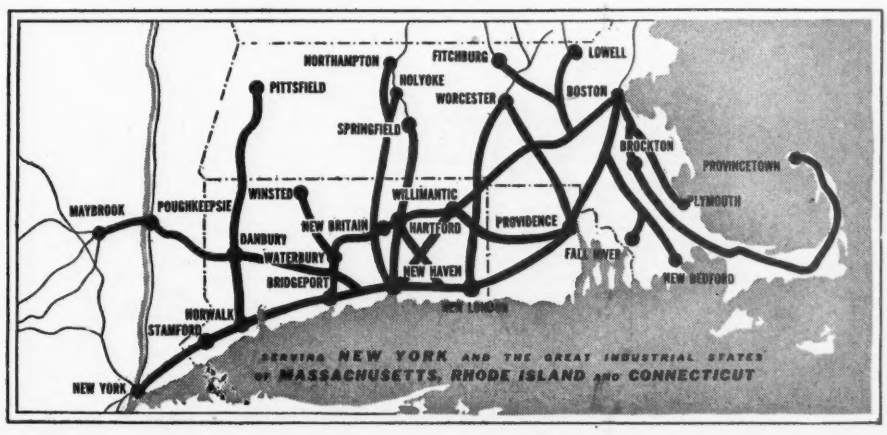


Billions of Kilowatt Hours are produced annually in Southern New England.

The high concentration of industry in Southern New England has resulted in a network of power facilities second to none in America. In this compact area, transmission lines are short and industry is assured of an adequate and dependable power supply at reasonable rates through numerous inter-connected feeder lines.

A well-integrated power supply is just one of the many industrial advantages to be found in Southern New England. For more facts on all the benefits available for your new plant location, write for the new booklet, "SOUTHERN NEW ENGLAND FOR TOMORROW'S INDUSTRY." Address: P. E. Benjamin, Mgr., Industrial Development, New Haven R. R., Room 201K, 80 Federal Street, Boston 10, Mass.

THE **NEW HAVEN** R. R.



DEVELOPMENTS IN DISTRIBUTION

IEFC Issues Tentative Meat Export Program

To provide a pattern for world export-import trade in meat during the early part of 1947, the International Emergency Food Council issued a recommended tentative procurement program for meat in the 6 months ending June 30, 1947.

The tentative program is necessitated by the fact that the nations, whose representatives compose the Committee on Meat and Meat Products, have been unable to find a means of stretching the available world export supply of meat for the year to cover the basic import requirements submitted by the consuming countries.

The program provides for the following exports from designated countries and groups of countries in the first 6 months of 1947: Argentina, 768,000,000 lb.; other South American countries, 268,200,000 lb.; Canada, 266,000,000 lb.; New Zealand, 445,000,000 lb.; Australia, 270,000,000 lb.; United States of America, 115,900,000 lb.; miscellaneous suppliers (such as Eire, Madagascar, S. Rhodesia, etc.) 31,000,000 lb. The other major supplier of meat in export-import trade is Denmark. The allocations of Danish meat for the entire calendar year have been made by the committee and will provide for some of the needs of importing nations in the 6 months covered by the tentative procurement program.

Enough Steel in 1948 For Can Requirements

NEW rolling mill capacity (about 400,000 tons per year) will go into production late this year but not in time to have any effect on the supply of tin cans. Next year steel will no longer be the limiting factor in can supply as it has been throughout the war. Tin supply will then tell whether cans are available in whatever quantities and sizes food processors want.

Official forecasts for the 1947 supply of tin are for a continuation of the shortage. Estimates of Far Eastern production in 1946 are less than 12,000 tons in comparison to 147,000 tons in 1940. Production this year may not go as high as 75,000 tons, and it is hardly probable that the 1940 level can be reached by 1949.

"Boston has banned our new label!"

Bolivian production of tin this year is expected to remain about where it was last year providing internal difficulties in the country do not get worse. Other sources of supply upon which the United States drew in the war years are now moving to other markets or are substantially depleted.

In 1946, tin stocks in the U. S. declined 14,000 tons to the 54,000 ton level. This is not a comfortable amount to have on hand. A large part of the concentrates at the Texas City Smelter are immobilized in working and in process stocks, which has the effect of cutting the available tin supply.

Shipments last year from abroad were at satisfactory levels, but stocks of concentrates abroad declined. Late in the year the Texas Smelter had to curtail production because of the lack of high grade concentrates, which originate in the Netherlands East Indies. Operations in 1947 will depend largely on the rate NEI concentrates are received. That in turn will depend on current production there. Imports from the Netherlands East Indies last year, amounting to 6,000 tons, were the first since Japan occupied the islands in 1942. These shipments were largely from stock.

Restriction on can sizes were tossed out by CPA, but control of the weight of plate was retained in an early March action. This was done on the supposition that Congress would continue some control over tin as well as rents, sugar, rice and possibly a few other products such as synthetic rubber.

World Food Situation Only a Little Better

THE world food situation is now only slightly better than a year ago, despite a production gain in 1946-47 of about 7 percent over the year before, according to the U. S. Department of Agriculture.

In its final scheduled report of 1946-47 world food prospects, the department's Office of Foreign Agricultural Relations said that, although the number of countries in acute need of food is smaller than a year earlier, there are still several countries where the present low level of food rations will have to be sharply reduced unless large imports are received before the next harvest.

The most serious food shortages are in parts of Europe, particularly Germany, Austria, Rumania, in the Soviet Union, and in the deficit producing countries of the Far East.

In a large part of the world, food consumption is as great as, or greater than before the war. It is at a very high level in some surplus producing countries where purchasing power has been increased by unusual industrial activity, or high prices of raw materials.

American Can Delivers On 85 Percent Ratio

AMERICAN CAN CO. will deliver metal containers at a rate of 85 percent of the base selected by each customer under the 1947 allocation plan it outlined to the trade in January.

The 85 per cent ratio, according to W. C. Stolk, vice-president, is based on all available information as to 1947 plate production and contemplates no interruption in receipts from suppliers, which would, of course, necessitate a reduction. However, Mr. Stolk said, it is hoped that production of plate will increase in the third and fourth quarters to the extent that more generous allocation will be possible.

High Court Refuses To Rule on Macaroni

THE power of the Food and Drug Administration to seize foods, drugs and cosmetics, which are found to be spoiled after they have been shipped in interstate commerce, was put in jeopardy when the Supreme Court unexpectedly refused to review the Phelps-Dodge macaroni case. F&DA has been exercising this authority ever since enactment of the original Food and Drugs Act in 1906. It had never been contested.

Supreme Court review was requested by the government when the 9th Circuit Court of Appeals ruled that the Arizona U. S. District Court did not exceed its authority when it dismissed the F&DA seizure action on the ground that the shipment had come to rest. The court pointed out that while the act of 1906 specifically permitted seizure of articles after interstate shipment while in their original unbroken packages, the present 1938 law does not contain this language. Circuit Judge Mathews said it should not be read in by construction.

Lawyers of the Federal Security Agency (F&DA's "parent company") and of the Department of Justice are considering whether to ask the Supreme Court for reconsideration. F&DA officials say that, otherwise the only alternative will be to ask Congress for clarifying legislation.

but how they can MULTIPLY!

In rapidly increasing millions, dangerous bacteria attack product quality *unless* all surfaces and equipment, wherever food or beverages are handled, are kept scrupulously clean and sanitized.

Lo-Bax, the concentrated, fast-killing chlorine bactericide, helps prevent food spoilage and improves quality standards by rigidly controlling bacteria and sanitizing all surfaces with which food or beverages come in contact.

Simple and easy to handle—winter or summer—Lo-Bax kills bacteria almost instantly on contact . . . and at amazingly low cost. It dissolves quickly in water—hot or cold, hard or soft—to make clear chlorine rinse solutions. Lo-Bax, with its 50% available chlorine, is dependable—retains its strength as packed in original container.

Let us tell you how Lo-Bax can help you maintain high quality standards the year round. Write us today. THE MATHIESON ALKALI WORKS (INC.), 60 East 42nd Street, New York 17, N. Y.

LO-BAX
50%
AVAILABLE CHLORINE
LO-BAX SPECIAL
—a superior chlorine bactericide in granular form—packed in 2½-lb. bottles, ½ doz. to the case; and in 14-oz. bottles, 1 doz. to the case.
LO-BAX POWDER
—a highly efficient chlorine bactericide packed in 1¾-lb. bottles, 1 doz. to the case.

Mathieson
LO-BAX
CHLORINE BACTERICIDE
50% AVAILABLE CHLORINE

Lo-Bax . . . Super-Nufos . . . HTH-15 . . . Dry Ice . . . Carbonic Gas . . . Ammonia, Anhydrous & Aqua . . . Caustic Soda . . . Soda Ash . . . Bicarbonate of Soda . . . Liquid Chlorine . . . Chlorine Dioxide . . . PH-Plus . . . Synthetic Salt Cake . . . Sodium Chlorite Products . . . Sodium Methylate

SYNTHETIC FOOD ADJUNCTS

By Morris B. Jacobs, Ph.D.

Here, in the most comprehensive handbook ever published on synthetic food materials, is complete fingertip information about how to make and use all synthetic adjuncts used in the food industries.

Full directions for mixing, blending and formulation include vitamins, vitagens, preservatives, antioxidants, stabilizers and emulsifiers; as well as dry colors, coloring solutions, and flavors of all types.

This great wealth of practical information gives all facts on the protection against spoilage by light or oxidation, the limitations imposed by toxicity of organic compounds, the vitamin requirements of enriched foods, and countless other facts and figures. In sum, this brand-new reference work gives you the most up-to-date formulas, the best practices, and the most complete data ever published on every synthetic adjunct used in the production of foods.

Examine This Great Book FREE

MAIL THE COUPON NOW

D. Van Nostrand Company Inc.,
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Please send me a copy of "Synthetic Food Adjuncts." Within 10 days I will either return the book, or send you $5.50 plus a few cents postage.

Name .....

Address .....

City .....State.....

Food Ind.-April 1947

Vi-Co

NATURAL "B" COMPLEX YEAST VITAMIN PRODUCTS AND YEAST DERIVATIVES

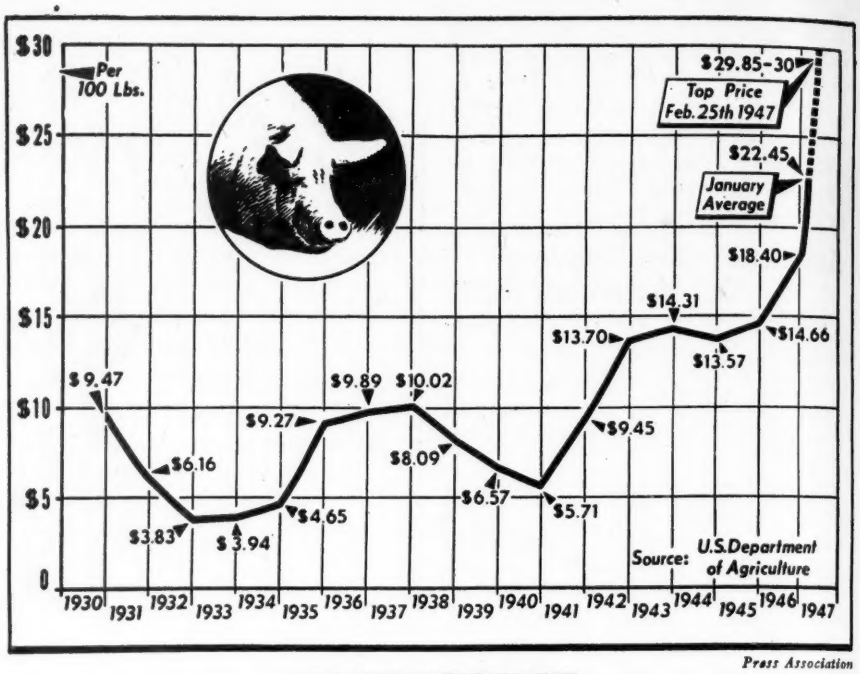
Plasmolyzed Yeast Extracts for FOOD and AMINO ACID PREPARATIONS

Vi-Co Plasmolyzed Yeast Extracts are prepared by enzyme digestion of brewers' yeast to yield a B complex product rich in essential amino acids. Amino acids provide the necessary "building blocks" for healthier and stronger bodies.

These products possess a definite "meat-like" flavor useful in enriching soups, bouillon cubes, tomato juice and other packaged foods. Such enriched foods are also of value for their natural B complex and high amino acid composition.

Consult us about your vitamin or yeast problems. Our technical staff can best advise you how Vi-Co products can be used to enrich your own products.

VICO PRODUCTS CO.
415 W. Scott St. • Chicago 10, Illinois



Press Association

HOG PRICES HIT NEW HIGH

The average hog price for each year since 1930 and up to February 25 forceably illustrates the record high reached up to that date, when $30 per cwt. was established.

Government lawyers agree that in distinguishing between state and federal powers, Congress has usually employed specific language.

Another Reversal

Coincident with the action of the Supreme Court, the 9th Circuit hit the F&DA a second body blow when it approved a California district court's dismissal of a criminal prosecution involving advertising circulars shipped separately from the product. F&DA has won several costs in which the courts have held that labeling includes any advertising matter that reaches the customer along with the product, regardless of the time interval and the routes that each have traveled. These decisions have strongly supported F&DA's efforts to curb use of advertising matter to disseminate therapeutic claims that would not be legal if placed directly on the package. Reversing the trend, the 9th Circuit ruled that under the law "accompany" means a common source, common destination and simultaneous arrival. Appeal to the Supreme Court is expected.

Coming together, the two court decisions have given F&DA its worst legal set-back since the famous Johnson Cancer Cure decision of the Supreme Court in 1911. In that case the court held that drug manufacturers were not responsible for therapeutic claims because they were in the realm of medical opinion. The breach was subsequently closed by a congressional amendment.

China Is Importing Soybean Products

AMERICAN soybean products may be destined to move from the United States to the lands of their origin —the Orient. Trade circles have heard that the Army is purchasing soy flour for civilian relief feeding in the Far East. Tending to substantiate these reports is an announcement by A. E. Staley Manufacturing Co. that it has contracted with the U. S. Army Quartermaster Corps for shipment of 17,000,000 lb. of soy flour within the next two months, for movement via Gulf ports.

Of this amount, 7,000,000 lb. will be low fat soy flour made from beans processed by the expeller process, containing not more than 6 percent soybean oil, and 10,000,000 lb. will be defatted flour made from beans processed by the hexane extraction process, and containing less than one percent oil.

Foresee No Change in Market Agreement Act

NEW legislation, which would bring fruit and vegetables under the terms of the Marketing Agreements Act, is not likely. An amendment to broaden the base to cover general farm commodities and permit the operation of the marketing agreements when the price of the commodity covered is above parity as well as below, has again been sponsored by the American Farm Bureau Federation. Similar legislation failed in the senate last year.

IS YOUR SLIPPAGE SHOWING?

..Important question for users of reciprocating pumps and air or hydraulic cylinder mechanisms

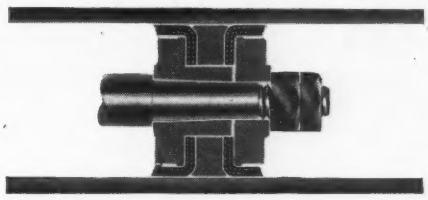
ILLUSTRATIONS at right show how Darcova Pumcups, in contrast to ordinary piston packing, virtually eliminate fluid slippage for the entire life of the packing. And, Pumcup life is many times that of ordinary packing.

By holding slippage to an absolute minimum, Pumcups permit reduced operating speeds, maintain high volumetric efficiency, prolong equipment life, save power, prevent wire-draw and uneven cylinder wear, and eliminate the need for frequent replacement shutdowns.

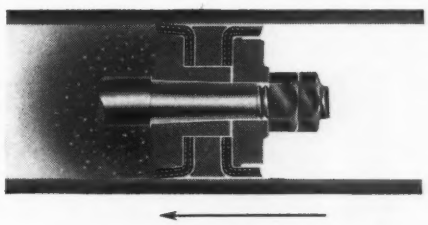
So if slippage is showing up in your operating and maintenance records . . . if replacement of packing is a too-frequent chore, that's your cue to switch to Darcova Pumcups.

For a free bulletin containing complete information, write, or use the coupon below.

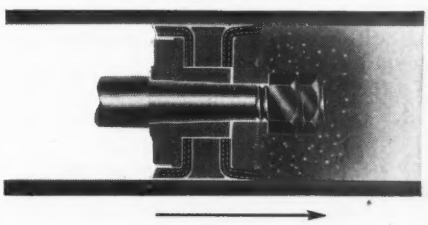
DIAGRAM OF PUMCUP ACTION GREATLY EXAGGERATED



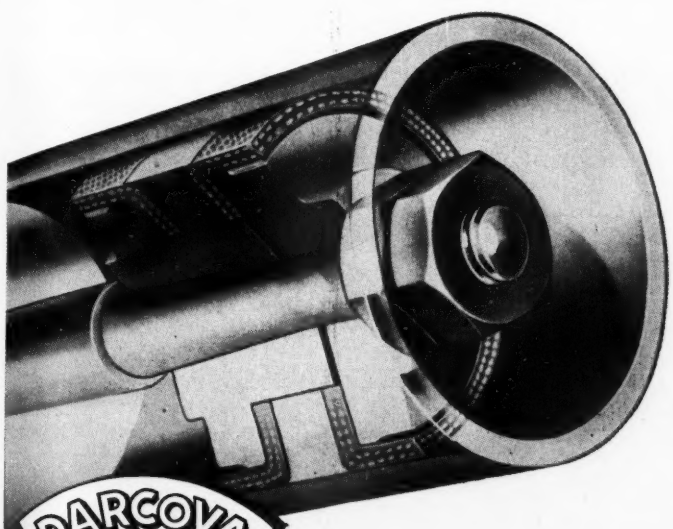
NORMAL: BOTH PUMCUPS RELAXED



UNDER PRESSURE: PUMCUPS SEAL AGAINST CYLINDER DESPITE WEAR, MINIMIZING SLIPPAGE



Darcova Pumcups replace ordinary packing in reciprocating pumps and also in air or hydraulic control mechanisms. They are precision built of an exclusive, exceptionally durable composition material available in many textures for use with almost any fluid under a wide range of pressures and temperatures. Standard sizes range from ½ to 42 inches in diameter.



DARCOVA
TRADE MARK
THE ORIGINAL COMPOSITION CUP

DARLING VALVE & Manufacturing Co.
WILLIAMSPORT, PA.

Darling Valve & Mfg. Co., Williamsport 61, Pa.
Please send me the free bulletin checked below:
☐ No. 4401... Darcova Pumcups for reciprocating pumps.
☐ No. 4502... Darcova Pumcups for air or hydraulic mechanisms.

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

Hard Working
PROTECTION

HODGMAN APRONS
for Safety and Efficiency
in the Food Industries

No. 7100

Combining maximum protection with hard-wearing quality and free action comfort, Hodgman Industrial Aprons have been found particularly adaptable to industries in the food field.

No. 7075 (above) is a rugged, serviceable white apron widely used in the dairy, canning and packing industries.

No. 7100 is a strong black apron resistant to dilute acids and abrasion. The No. 7100 apron is used especially for acid protection.

No. 7130

No. 7130 is a white apron made especially for use in canning products with liquid content. Made of sheeting and coated with synthetic rubber on both sides, it withstands much abuse and affords long service.

Send for complete details regarding Hodgman Aprons for industrial use.

HODGMAN
Rubber Company
FRAMINGHAM, MASS.

This year it has been opposed vigorously by the canners, the poultry and egg industries, the dairy industry and others.

The dairy people want no change. The law, as it relates to milk producers, has a long, successful history. Legal questions relating to its operation had been argued through the courts and milk producers ask that the law remain as is, so that the litigation would not have to be done over again. Other industries seeking the benefits of the marketing agreement act should sponsor their own law.

Processors have the assurance of the house agricultural leaders that if the bill should be reported it will be stripped of all controversial matter. There is doubt as to whether the bill will even get out of committee.

Orange Juice Bought

PURCHASES this fiscal year of concentrated orange juice for the National School Lunch Program have included 755,000 gallons. U. S. Department of Agriculture buying of this amount has been mainly during January and February, 1947. No further purchases are expected for this school year.

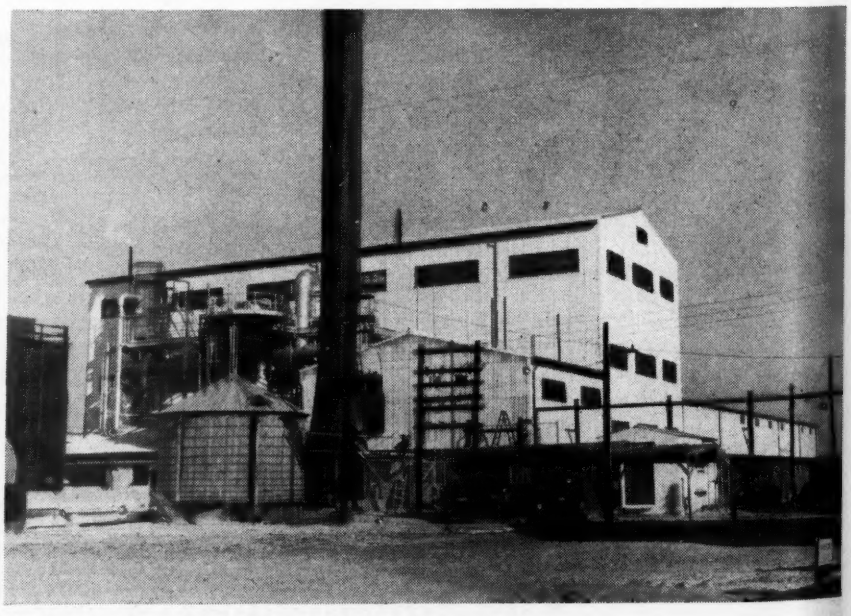
Sanitation Course

MILL sanitation courses sponsored by the Association of Operative Millers, the National Soft Wheat Millers Association and the Millers National Federation will be held in Indianapolis, beginning April 25, Los Angeles, May 6-8 and Portland, Ore., May 12 to 14. The original course on mill sanitation was given at the University of Minnesota last November. The need of improving flour mill housekeeping is so great and the demand for instruction on methods of fumigation is so extensive that these additional courses are being given.

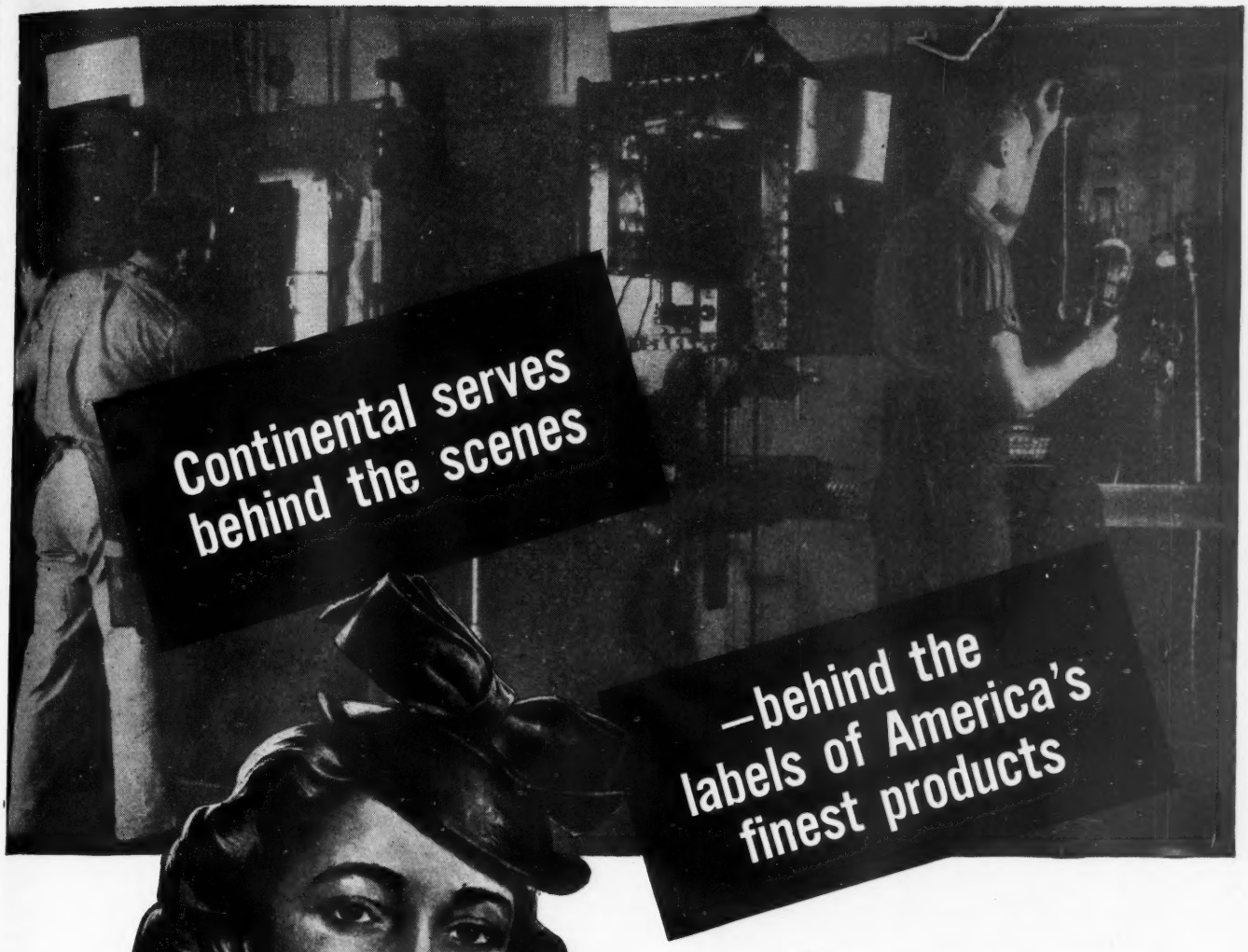
Allocations Reveal Cocoa Supply Decline

FINAL recommendations for the allocation of cocoa for the 1946-47 marketing year, which ends September 30, were announced late in February. United States share is 258,300 long tons, down 500 tons from last year. This compares with a prewar consumption of 274,000 long tons and statement requirements for the year amounting to 330,000 long tons. Allocation of cocoa for this year was on an equitable basis, every country being cut about the same percentage wise.

Outlook for 1947-48 period is for a continuation of the rising demand to follow closely the increased supplies of sugar and the capacity to process cocoa. The supply picture is not good. According to the report of Dr. D. A. Fitzgerald, secretary-general of the International Emergency Food Council, there is little prospect of increased supplies; in fact the reverse is probable. Tree disease is already affecting production in West Africa. Hopes are expressed that the present period of high prices will stimulate plantings throughout the world, but such plantings can only augment world supplies on reaching maturity after five to seven years. Other opinion



NEW CITRUS PLANT
Vacuum Foods Corp. began operations in its new plant, at Plymouth, Fla., in February. The plant manufactures powdered orange juice and frozen orange concentrate.



WHEN WE SAY Continental cans serve *behind* the labels of America's finest products, we are not overlooking the labels, themselves. Those labels we *lithograph*, that is!

No doubt about it, Continental labels serve, too! They make packages attractive—easier to sell. A smart design, faithfully reproduced by modern lithography, stands out as effective point-of-sale advertising for the product.

Our customers seem to appreciate this important "plus," because, every day, they're looking more and more to the Triple-C trademark for the "best in quality, best in service."

CONTINENTAL
CAN COMPANY

100 East 42nd Street, New York 17, N. Y.

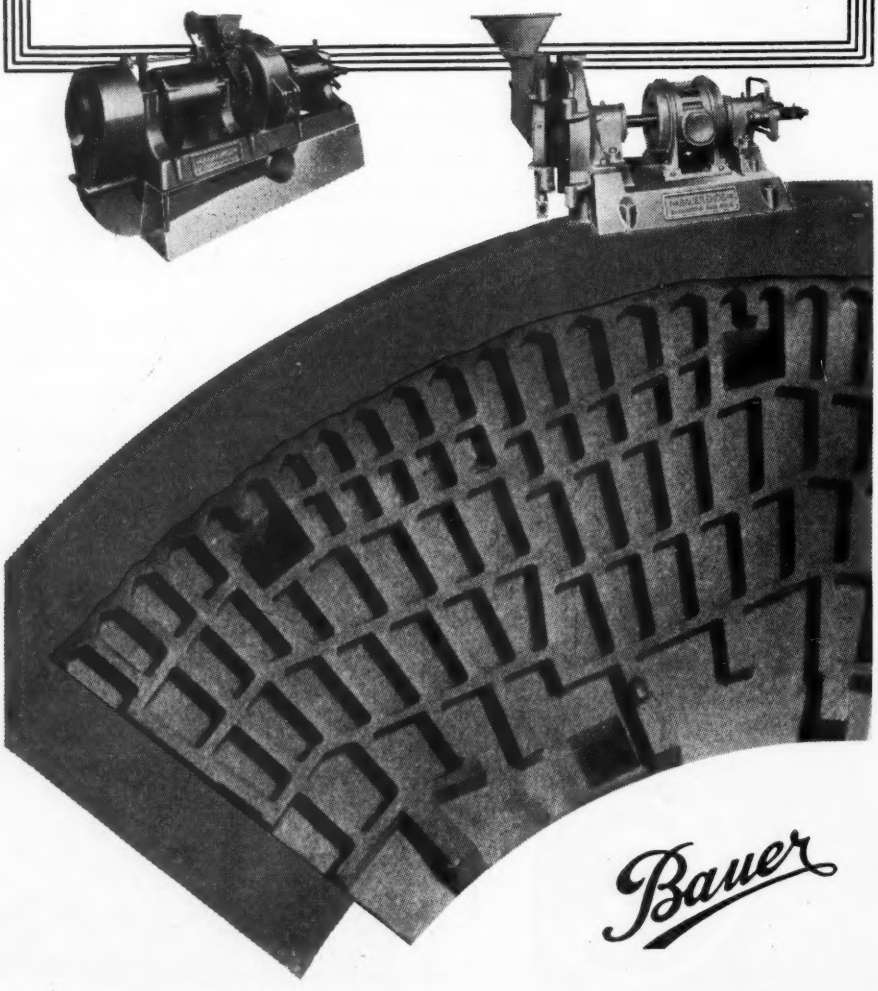
GENUINE *Bauer* PLATES

FOR DOUBLE AND SINGLE REVOLVING DISC MILLS AND DISC TYPE HULLERS

BAUER PLATES are cast of a special patented alloy that is highly abrasion resistant. They are skillfully cast and ground and painstakingly balanced—hence, give far longer service on the job.

Many plate patterns—the right pattern and size for any type or size mill—special plates for specific grinding requirements.

THE BAUER BROS. CO.
SPRINGFIELD, OHIO



suggests that native producers of West Africa may be content to secure much the same income and that high prices will act there as a deterrent rather than an incentive to production; whilst the stimulating effect of high prices will be limited to areas such as Brazil and British West Indies, where cocoa is plantation grown.

Taylor Paves Way to Sound Price Policy

RECOGNIZING the stabilization of prices as an essential step in the re-establishment of a firm national economy, the Taylor Instrument Companies will abandon the wartime escalator clause based on price at time of shipment.

The new firm price policy became effective in February, despite the fact that much of the material going into their products is still being bought at the fluctuating prices. The Taylor company thus becomes one of the first to establish its prices on a sound peacetime footing.

PROCESSING

Plan to Discuss Cheese Standards

COMPREHENSIVE proposals for standards of identity for cheeses were issued in the February 21 Federal Register, covering amendments to three standards of identity already in effect. Definitions and standards for 41 additional cheeses were also proposed. Hearings are to begin at 10:00 a. m. on April 8, in Room 5541, Social Security Building, Washington, D. C. Presiding officer for the hearings is to be Edward E. Turkel.

Specifically named were 41 cheeses included under the category of "cheeses, processed cheeses, cheese foods, cheese spreads, and related foods." Fat and moisture contents, specific ingredients that may be used in various cheeses, and permissible names for each product are specified in the proposed standards.

This announcement, coupled with the Food Standards Committee meeting during the last week of March and the canned tomato hearing to amend the existing standard, all point to renewed activity on food standards on prewar scale. Final actions on canned beans and canned peas standards were announced too late in February to be included in last month's news review. Future standards hearings may be expect-

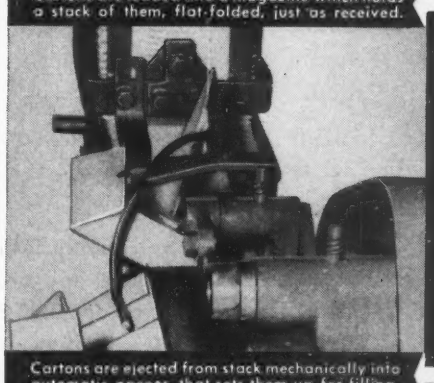
NOW, STILL HIGHER SPEEDS Filling Free-Running Frozen Foods!

UP TO 125 CARTONS A MINUTE...

In this new FMC Carton Filler, flat-folded cartons are automatically opened, set-up, filled with loose frozen or fresh granular foods; then automatically closed.

AUTOMATIC

Cartons are loaded into a magazine which holds a stack of them, flat-folded, just as received.



Cartons are ejected from stack mechanically into automatic opener, that sets them up for filling

Filled cartons are run thru device that automatically closes and presses them into shape

FILLED AND PACKED AUTOMATICALLY WITH

FMC CARTON FILLER
with opener and closer

In plant after plant, this new FMC Carton Filler is conclusively proving that free-running frozen foods can now be volume-packed mechanically—at speeds as high as 125 packages per minute on some products.

This latest FMC development brings to frozen-food packers, many spectacular advantages: greatly increased production capacity... substantial reduction in product handling and overall costs... far more efficient filling and packaging... better utilization of plant space.

It is designed and built for use with any make of one-piece, top-opening carton that can be handled automatically.

For detailed information on how this new FMC Carton Filler can help speed and improve your frozen-foods operations, send samples of your cartons and a list of your products today.

Send for your FREE Copy of Catalog describing most complete line of machinery and equipment for processing corn, peas, beans, fruits and many other products.

FMC

FOOD MACHINERY CORPORATION

Sprague-Sells Division • *Anderson-Barngrover Division*
Hoopeston, Illinois • *San Jose, California*

CF3001

BRANCHES: NEW YORK • BALTIMORE • SEATTLE • PORTLAND • LOS ANGELES

Fluorometer and spectrophotometer used to determine vitamins in food samples at Schwarz Laboratories.

Bottles...Cans...Cartons...

Which to Choose?
How to keep contents palatable?

Schwarz Laboratories Service can help you answer both of these questions.

In many instances, this service has helped to reduce the cost of packaging . . . to lengthen shelf life . . . to maintain the quality and flavor of products.

Schwarz chemical and biological analyses, tests and research are conducted by long-experienced and highly skilled laboratory technologists with the most modern equipment. Reports are interpreted on the basis of the Schwarz 77-year experience in this work; and authoritative, impartial recommendations are offered on raw materials, processes, sanitation controls and other improvement factors.

Write for Bulletin "Scientific Quality Control of Foods and Beverages" describing Schwarz services and facilities. Your inquiries are invited without obligation of any kind.

Schwarz LABORATORIES INC

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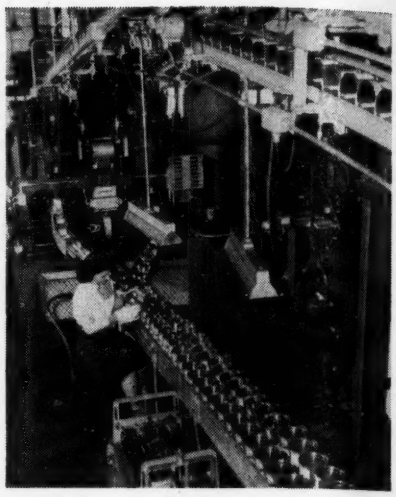
202 East 44th Street
New York 17, N. Y.



COFFEE TINS
For the first time since 1942, tin cans for vacuum packed coffee are coming from the production lines. This scene at one of the American Can Co. plants is being duplicated throughout the country. With steel and tin still short, however, all cans continue under company allocation.

ed on canned corn, salad dressings, and frozen fruits, the subjects of the March meeting of the Food Standards Committee. Still awaited when this issue went to press was the final order on corn meal standards.

Technical Services Report New Jap Flour

A JAPANESE "flour" which includes ingredients obtained from locusts, pumpkin seeds, water oats, arrowroot, seaweed, sagebrush, and radish, mulberry, and sweet potato leaves was developed by the Japanese Ministry of Agriculture to supplement postwar food supplies according to a report now on sale by the Office of Technical Services, Department of Commerce.

The report was prepared by investigators of the General Headquarters of the Supreme Commander for the Allied Powers in Japan.

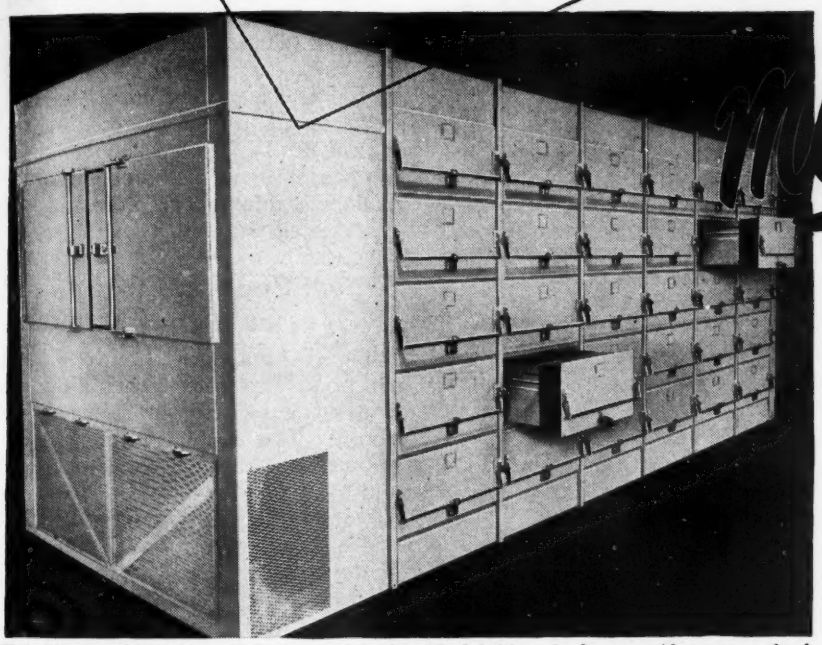
The flour is used by housewives to make bread, biscuits, and noodles. Plans to utilize these materials were completed in the fall of 1945 and expanded during 1946, the report states.

Japanese agricultural societies and forestry associations, assisted by primary school children collect and deliver the raw products to milling plants, where the materials are pulverized, mixed with wheat flour, and distributed to consumer outlets. Two parts of wheat flour are mixed with the one part of the substitute flour to overcome its peculiar taste.

The Japanese planned to have more than 600 milling plants in operation in 1946, producing approxi-

✔ Startling New Method
✔ Factory-Built
✔ Self-Contained Units
✔ Can be installed anywhere

FROZEN FOOD STORAGE *made easy!*



Unit illustrated is Iceberg Refrigerated Locker Model 660—60 drawers (drawers on both sides), each approximately 6 cu. ft. net storage capacity; 240 lbs. meat loading per drawer or its equivalent in other frozen foods. Models in Series 600 range in capacity from 10 to 80 drawers.

The Iceberg Refrigerated Locker is the answer to the constantly growing need for better, more economical bulk storage of frozen foods. No cold room necessary. This unit is complete and self-contained. Room in which it is installed remains at normal temperature.

Made in factory-built sections. Under normal conditions, installation can be completed in approximately 24 hours. Storage capacity may be varied by adding sections to fill changing needs. Various models offer storage capacities from approximately 30 to 480 cu. ft. Low installation and operating cost.

ECONOMICAL FOR:

Hotels
Chain Stores
Food Stores
Frozen Food stores
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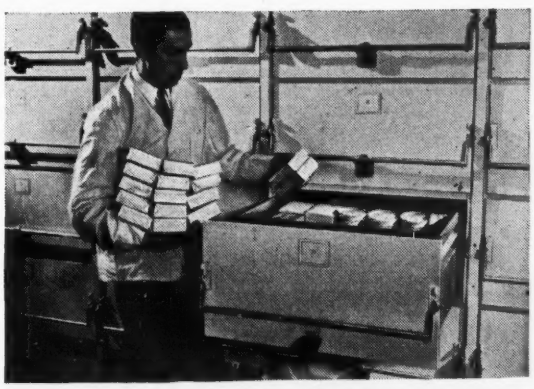
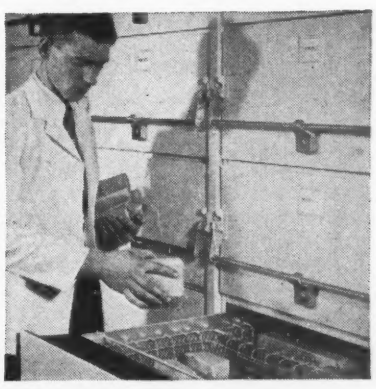


How it is used. Stored foods readily accessible at all times. Each drawer easily identified by name card. Drawers roll on top-suspended roller bearings. No sticking due to freezing. Drawers seal themselves from rest of unit while open. Automatic bar lock insures complete sealing when drawer is closed.



For blast-freezing. Special blast freezing drawers available for sharp freezing. Blast freezing drawers easily and quickly interchangeable with regular drawers in section next to refrigerating unit.

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"FROZEN FOOD STORAGE MADE EASY" tells the complete story of the Iceberg Refrigerated Locker. ABSOLUTELY FREE! Just use coupon.

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The exact alloy steel you need is ready for quick shipment from Ryerson because both prewar alloys and war-proved triple alloys are in stock. And under the Ryerson Certified Steel Plan you get a time-saving report with every alloy shipment. Chemical analysis, heat treatment response and recommended working temperatures included in the report are a helpful guide for designers and heat treaters, a reliable record for purchasing men. Call, wire or write the nearest Ryerson plant for diversified alloy stocks plus dependable alloy data.

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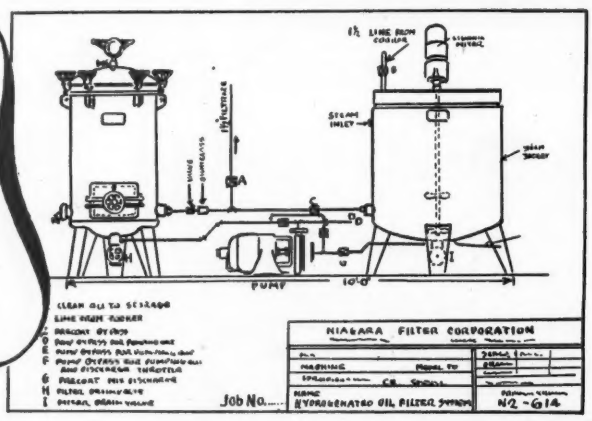
RYERSON STEEL

Another FILTRATION PROBLEM Presented To And Solved By The N.F.E.*



PROBLEM:

A nationally-known manufacturer of POTATO CHIPS presented us with this PROBLEM: clarify and treat hydrogenated cooking oils from potato chip cooking operations to produce a colorless-odorless oil.

Some of the factors included: eliminating charred material, decolorizing and deodorizing the oil, and absorbing the free fatty acids which are the prime cause of rancidity in fried products. An "N.F.E." solved this problem (a problem that also, by the way, is presented in nut blanching oils and doughnut frying—in fact, in all processes using automatic machines for commercial batch frying).

SOLUTION:

Niagara Filter engineered for this manufacturer a #45 Niagara hydrogenated oil filter system (complete with treating tank, pump and necessary piping) of sufficient size to give continuous operation—to eliminate charred matter, to decolorize, deodorize and absorb the free fatty acids. . . .

RESULTS:

The quality of the chips was consistent from batch to batch of cooking oil without carrying over undesirable odors or flavors picked up from continuous use. Shelf life, as a consequence, is increased tremendously.

***N.F.E.**=A Niagara Filtration Engineer . . . a trained graduate engineer with years of actual field experience in the chemical, food, fermentation and processing industries.

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In Canada

. . . Niagara Filter Corporation (Canada) Ltd.

Filtration Engineers To The Processing Industries

mately 115,000 metric tons of the flour, about one percent of total food production. The product has about the same caloric value as brown rice, but only half its nutritional value. It is intended primarily as a "stomach filler" for Japanese urban populations.

The report includes a general description of the plan with tables giving production figures and estimated caloric values of each of the ingredients.

Orders for the report (PB-47021; *Unusual Materials as Foodstuffs in Japan;* photostat, $1; microfilm, $1; 11 pages) should be addressed to the Office of Technical Service, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order made payable to the Treasurer of the United States.

Expect Congress to Subsidize Research

ODDS are that this Congress will set up a Federal Science Foundation to subsidize non-federal research. The subject is on the Republican docket of must legislation, and hearings have started. Strongest contender is a measure introduced by Senator Smith of New Jersey.

The Smith bill has taken the opposite tack on nearly all controversial features from the Kilgore bill of last year, which passed the Senate but was smothered in the House.

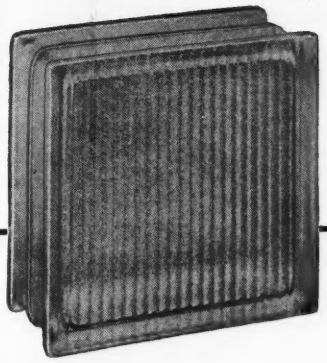
On administration: The Foundation would consist of 48 scholars, serving part time, who would elect a director and an executive committee to administer the program of research contracts, grants-in-aid, and fellowships.

On patents: The Smith bill would require only that equitable patent provisions be included in all research contracts.

An alternative bill incorporating the features of the Kilgore measure—a full time presidentially-appointed administrator, and a ban on patenting of research done with government funds—has been introduced by Senator Thomas, Utah Democrat. But it has little steam behind it.

Libby in Canada

LIBBY, MCNEILL & LIBBY of Canada, Ltd., have not yet definitely decided on the erection of a new canning plant at Vernon, B. C. Officials of the company recently advised the Vernon Board of Trade that articles, which had appeared in the Financial Post, definitely



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PC GLASS BLOCKS

Panels of PC Glass Blocks assure ample light, properly distributed. That enables workers to turn out more quality goods.

The insulating qualities of PC Glass Blocks reduce heat losses. Temperature levels are more easily maintained. Precision machines operate at maximum efficiency.

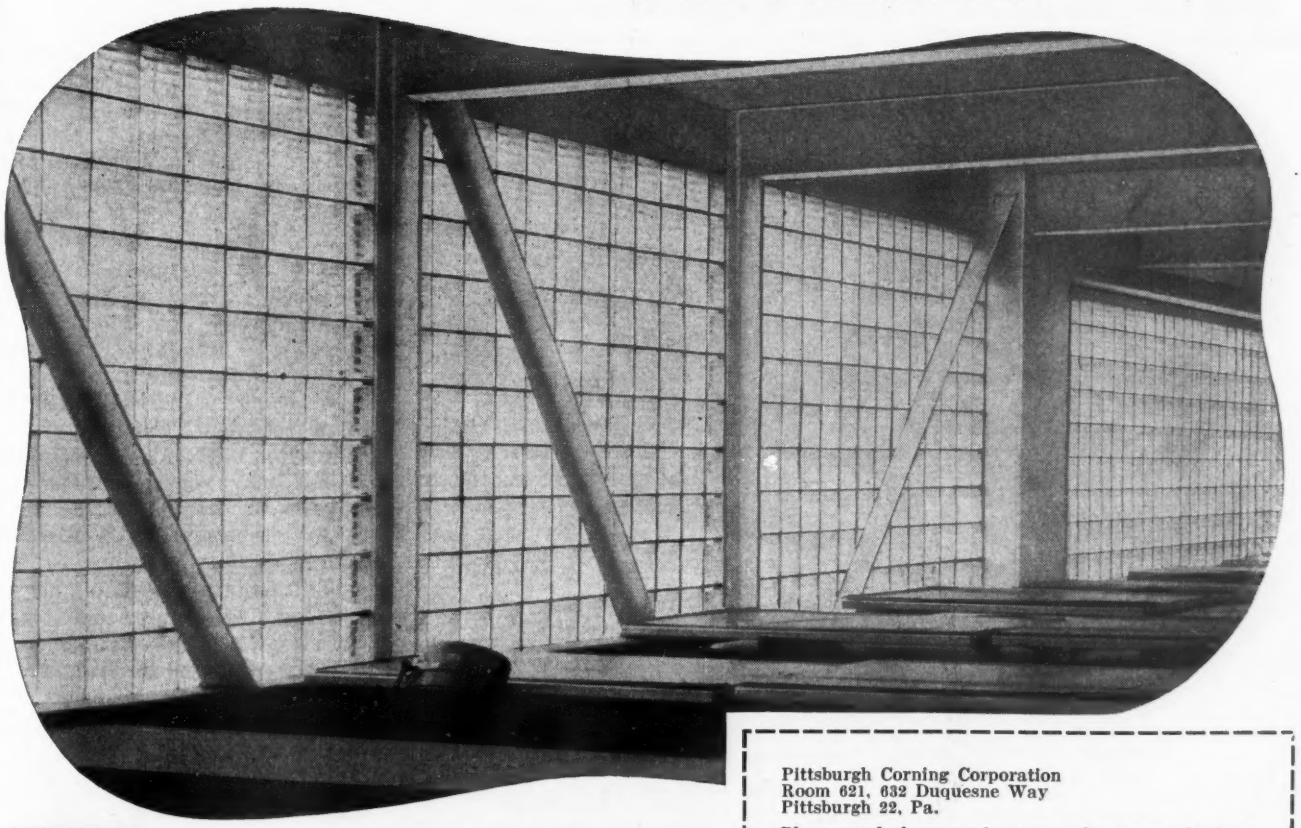
PC Glass Block panels exclude dust and grit, protect machines and goods in process from damage.

The smooth glass surfaces of PC Glass Blocks can be quickly and easily cleaned by one man with a wet brush.

These are some of the ways in which PC Glass Blocks step up food plant efficiency. They also reduce operating costs, by cutting artificial lighting costs, heating costs, the costs of maintenance labor and supplies.

Plan for greater efficiency in your present plant or in new projects with PC Glass Blocks. Make sure you have full information. Send for our current book, which describes and illustrates all sorts of PC Glass Block installations in processing plants. Pittsburgh Corning Corporation, 632 Duquesne Way, Pittsburgh 22, Pa.

· *Also Makers of PC Foamglas Insulation* ·



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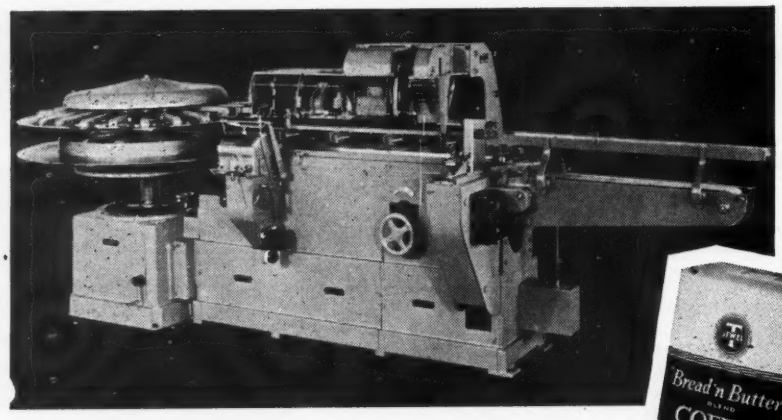

The SEALTITE Bag Sealer
CUTS PACKAGING COSTS

● Consolidated's SEALTITE Bag Sealer invariably results in important savings in packaging in paper bags. Some users report costs reduced as much as $500.00 per month per machine over previous methods of packaging.

SEALTITE handles any standard gusseted bag of 2 to 10 lbs. capacity. It settles, shapes and seals at speeds ranging from 30 to 50 bags per minute. SEALTITE produces a square, flat-topped sift-proof package that stacks like a carton. Any product usually packed in a paper bag can be packed in a SEALTITE package.

Write for information, prices and delivery.

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Now available in 12 sizes from 3 to 1050 lbs.-ft. torque capacity

Morflex couplings require no lubrication—do not throw grease or oil. Torsionally resilient Neoprene biscuit assembly isolates vibration, protects machinery from shock. Quiet-running, long-lasting. Send for further information.

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MORSE MECHANICAL POWER TRANSMISSION PRODUCTS

stating that decision had been made to go ahead with the Vernon plant, were unauthorized.

Officials stated that the plant was under consideration along with a number of other projects in various parts of the world, and a decision had not been arrived at as to whether Vernon plant was one that would be started immediately.

House Holds Hearings On Stream Pollution

THE question of federal control of stream pollution is due for Congressional airing soon. The House Public Works Committee has tentatively set hearings on pending legislation to start late in March.

Advocates of federal action believe there is good prospect for enactment. There have been gradual concessions by opposing sides during the last 20 years. Informal talks seeking to compromise the remaining major difference between industrial and conservation groups —the rigidity of federal enforcement—are being planned before the Congressional hearings begin.

The conservation groups are backing H.R. 123 introduced by Rep. Karl Mundt (R., S.D.) which provides the most stringent federal enforcement proposal. Leading industrial groups favor a bill (S. 418) sponsored by Senators Barkley and Taft, and a companion bill (H.R. 413) introduced by Rep. Brent Spence (D., Ky.).

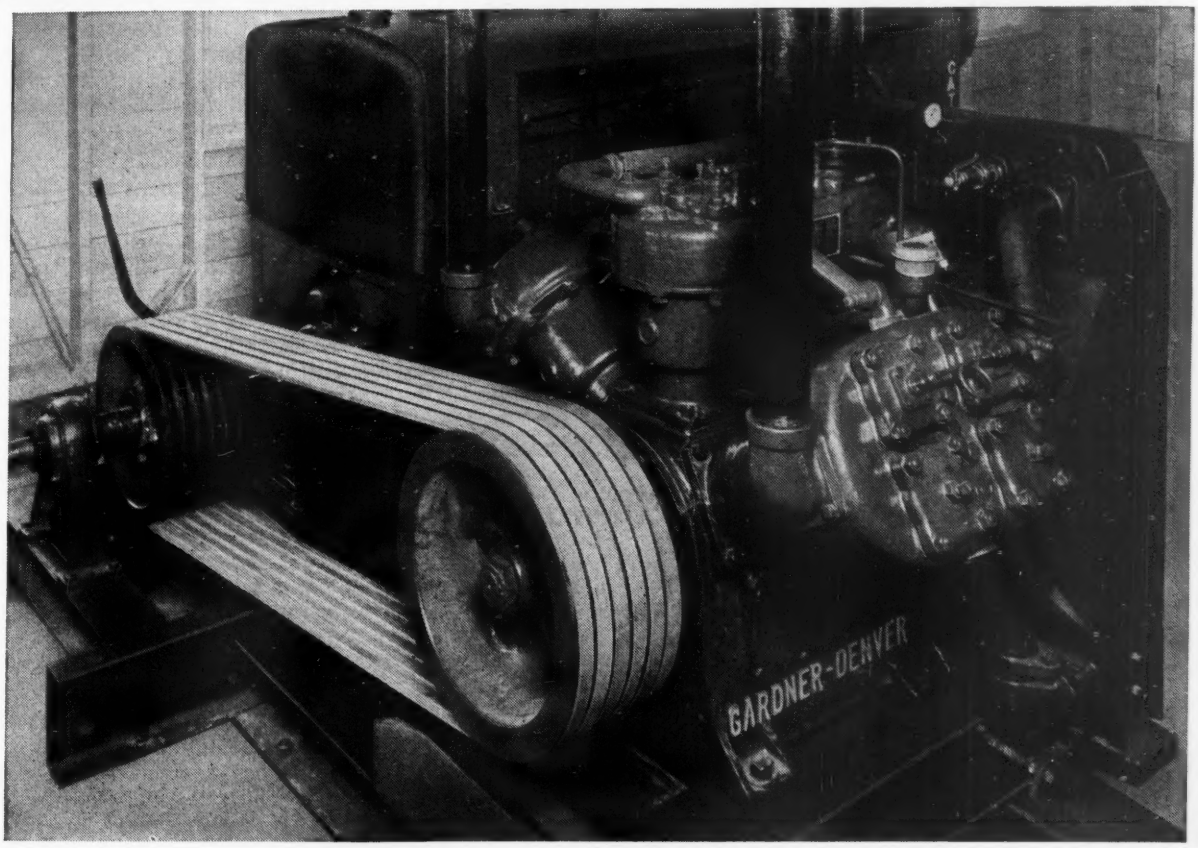
All of the bills would set up water pollution controls in the U. S. Public Health Service. They would authorize appropriations up to $100,000,000 annually for loans or grants to states and municipalities, or for loans to industry to finance waste treatment facilities.

Mundt's bill adds a prohibition against new sources of pollution and sets up more detailed machinery for enforcement of abatement orders. Mundt is willing to revise his enforcement formula, but he's standing firm against deleting the ban on new sources of pollution. He contends that unless it is written into law there can be abuses of the availability of federal funds to install correctional facilites.

Rule on Lecithin

ATTORNEY GENERAL TOM C. CLARK announced that a final judgment eliminating restraints in the manufacture and sale of lecithin has been entered in the United States District Court at Cleveland, Ohio, against American Lecithin Company of Elmhurst, Long Island,

What do careful buyers know about this "WB" Compressor?



It's an open secret among buyers that Gardner-Denver Class "WB" Air Compressors, though compact in size and rated as "small machines," develop efficiencies comparable to those of large two-stage horizontal compressors! In other words, *you get more air output in less space — and at low cost.*

The reason? Class "WB" compressors are a departure from conventional design. The use of two small water-cooled cylinders where one large one is ordinarily used results in lower air temperatures — saving in horsepower — considerably reduced inertia load. Other "WB" features you'll value are:

- ✻ *Combination radiator and air-cooled intercooler permits use where cooling water is scarce or of poor quality.*
- ✻ *Completely water-jacketed cylinders for maximum operating efficiency in any temperature or at any altitude.*
- ✻ *Silent "cushioned" Duo-Plate valves.*
- ✻ *Positive pressure system of lubrication from oil pump.*
- ✻ *Timken tapered roller main bearings.*

For complete information, write
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USE COMPRESSED AIR FOR SAFETY CONVENIENCE FLEXIBILITY

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POINTERS

How to help control bacteria and mold in the BAKERY

Keeping your bakery spotless and sanitary is a vital yet thankless task. Here is a simple program designed to help you control bacterial and mold growths in your plant . . . easily, economically.

1. Clean and then sanitize all mixing equipment in a solution of Per*chlor*on and water at the end of each day's work.

2. Seal all cracks or crevices around pipes and machinery.

3. Wash down all walls, tables, shelves and floors daily, then flush or spray with Per*chlor*on solution.

4. Apply Per*chlor*on washes in the steam box periodically to hold down mold and bacterial growths.

5. Keep employees' washroom clean by regular scrubbing and then disinfect with Per*chlor*on.

Per*chlor*on is a high test, stable calcium hypochlorite powder containing not less than 70% available chlorine. Effectively sanitizes, yet does not impart odors or off-flavors to foods coming in contact with sanitized equipment. We'll be glad to assist you with your sanitizing problems . . . write for information and service help.

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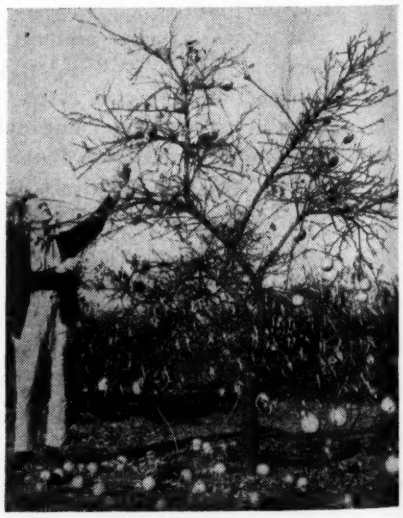
New York; Archer-Daniels-Midland Company of Minneapolis, Minnesota; The Glidden Company of Cleveland, Ohio, and Ross & Rowe, Inc., of New York, New York. This judgment, Mr. Clark stated, ends various illegal domestic arrangements and an International Cartel agreement, involving American, German and Danish producers of lecithin.

Grind Shells and All Into Powdered Eggs

ADDING finely ground egg shell to powdered eggs is one way of adding calcium to the diet, according to the Department of Agriculture. While this may be desirable nutritionally, public acceptance has still to be appraised.

The department's research work has taken two general directions. The Bureau of Animal Industry has determined the effect of the "fortification" upon poultry feed in which powdered eggs have been used as one of the concentrated food constituents. The Bureau of Human Nutrition and Home Economics has made a series of studies to determine the cooking quality and the palatability of food in which "fortified" dried eggs were used in the same way as ordinary dried eggs.

"It was found," the department reports, "that the addition of 0.4 percent eggshell, ground to pass a U. S. No. 400 sieve (openings of 0.0015 inch), yielded a product which could be used without detection in scrambled eggs, custards, ice cream, foundation cakes, muffins, popovers, and yeast rolls. Eggshell particles somewhat coarser than the 400-sieve size were not detectable



CITRUS FREEZE

Not only low temperatures, but high winds brought losses to the Florida citrus crop in February. It is estimated that more than 11,500,000 boxes were lost from a forecast total of 204,000,000 boxes.

6 a. m. : POWERMASTER DELIVERED

12 noon: INSTALLED and OPERATING

Putting in a Powermaster is quick and easy. Boiler, oil-burner, condensate return system and control panel are "packaged" in one compact unit, mounted on a structural steel base. The O&S Powermaster Steam Generator is delivered complete and—after simple service connections—ready to supply all the steam you need. No extensive preparations to make. No costly foundation to build. No smoke-belching chimney needed. Installation can be made in as few as four hours without interruption to production. Write for latest bulletin.

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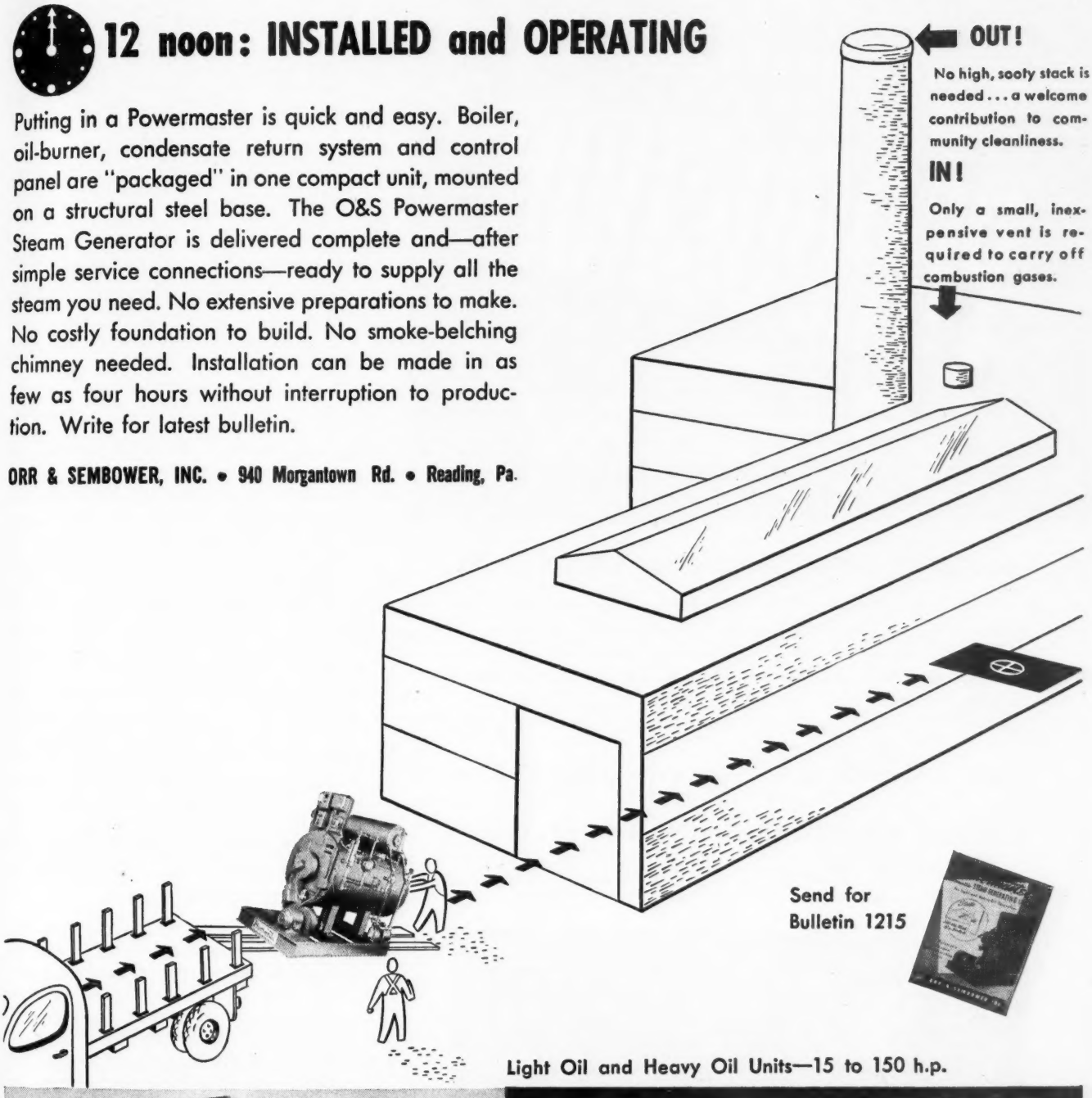
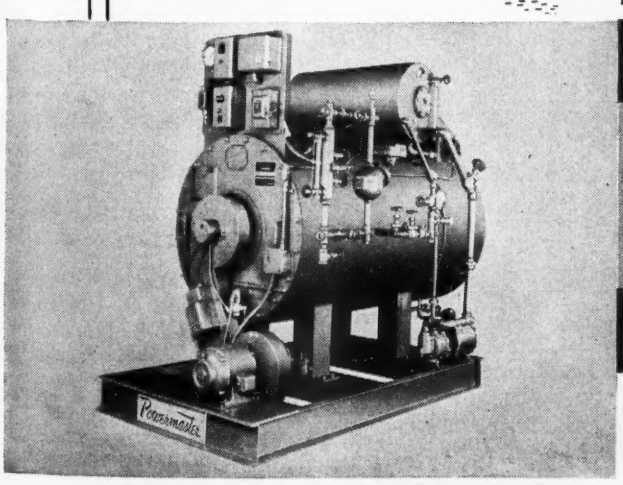

OUT!
No high, sooty stack is needed . . . a welcome contribution to community cleanliness.
IN!
Only a small, inexpensive vent is required to carry off combustion gases.

Send for Bulletin 1215



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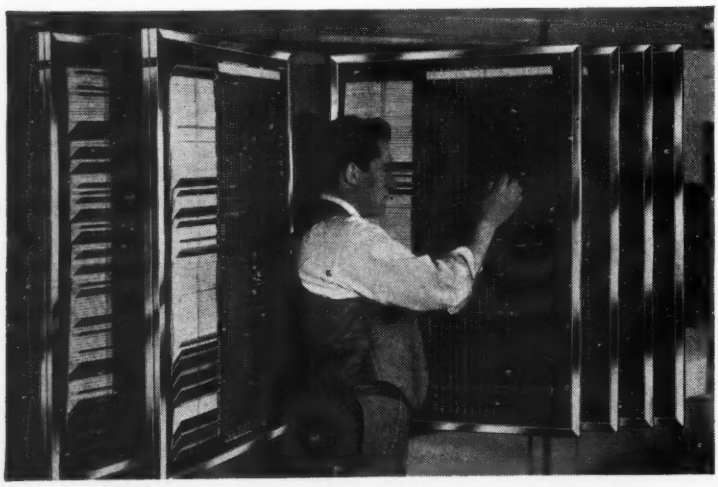


Produc-Trol
PICTURES FACTS FOR ACTION

in baked custards, in vanilla flavored refrigerator ice cream, or in foundation cake and yeast rolls."

The nutritional effect on humans has not been checked. Neither has there been a check upon the change in flavor and texture of food products as the ground shell content is increased above 0.4 percent. It is desirable, according to Department of Agriculture nutritionists, to increase the ratio of calcium to phosphorous in dried eggs from the normal of about 1 to 4 to a ratio approaching 1 to 1.

Summer Shortage Seen For Fats and Oils

FATS and oils available in the next six months to domestic consumers, both individual and industrial, will be less than desired by the Department of Agriculture if International Emergency Food Council proposals for world allocation of fats and oils are adopted. Mr. O. W. Herrmann, head of the fats and oils division of the Production and Marketing Administration, made this forecast during testimony in mid-February before a House committee investigating food shortages.

His prediction was that edible fats and oils will be "very short" from April through September. This conclusion was reached, and department opposition to the IEFC proposals was said to be based, upon proposal allocation of fats and oils to consuming countries other than the United States, although this country is normally the market for some of the diverted fats and oils.

Depreciation Report

A GOOD many manufacturers are carrying production equipment on their books at its cost several years ago and are not charging depreciation at current cost of replacement, according to the Machinery and Allied Products Institute. This means that since they have not allowed for sufficient equipment depreciation in their selling prices, they will have to take dollars from reserves, or from loans, for replacements when necessary. The Institute will soon issue a report on the subject.

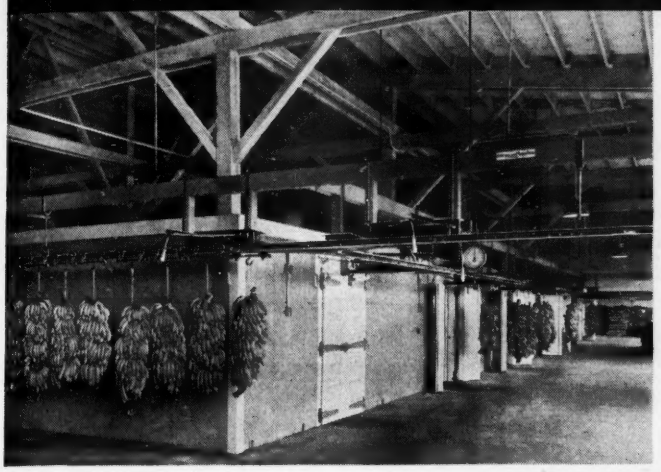
Soybean Support

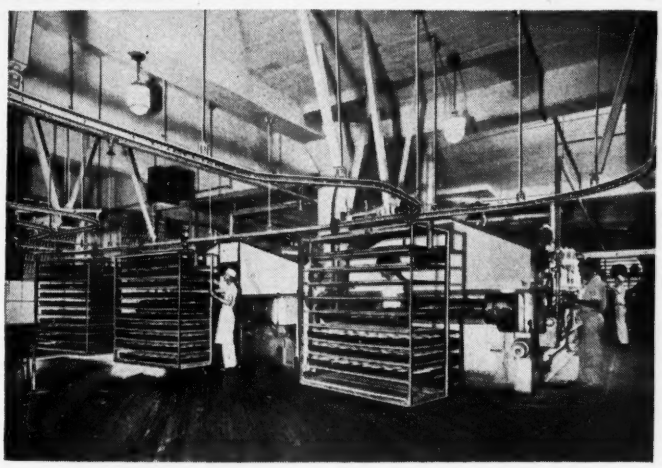
THE Department of Agriculture has set the support price of 1947-crop soybeans, grading U. S. No. 2 and containing 14 percent moisture, at $2.04 per bushel for green and yellow varieties and $1.84 for brown, black, and mixed varieties.

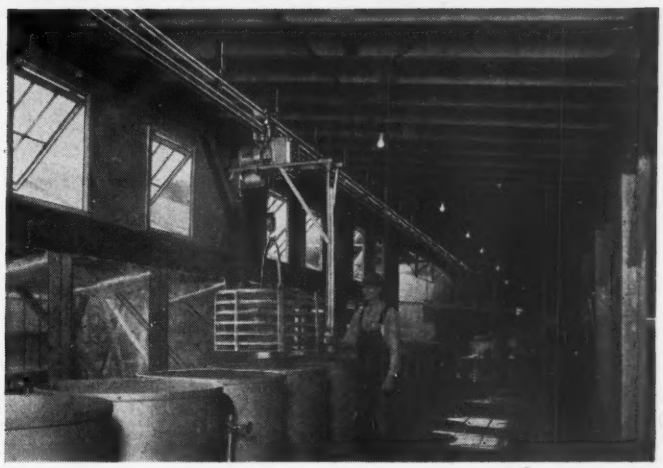
The support price has been con-

You can speed up PRODUCTION

. . . . at no extra cost!







You can speed up production, eliminate manual handling and rehandling, move materials on quick, accurate schedules, and do it at no extra cost.

American MonoRail Overhead Handling Systems have a universal range of uses in the food processing industry. From receiving room to shipping room American MonoRail equipment does the handling job better, quicker and more economically. A simple system pays for itself in a very short time.

Let an American MonoRail Engineer show you "all-round savings" with this equipment. Your inquiry is requested and without obligation, of course.

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Low in initial cost, the PALLETIER quickly pays for itself by permitting you to utilize more of your present space . . . saves manpower . . . reduces terminal time for loading and unloading railroad cars, highway trucks and planes.

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- Operator spots and tiers without stirring from seat.
- All control levers at driver's fingertips.
- Full magnetic control protects against forced acceleration.
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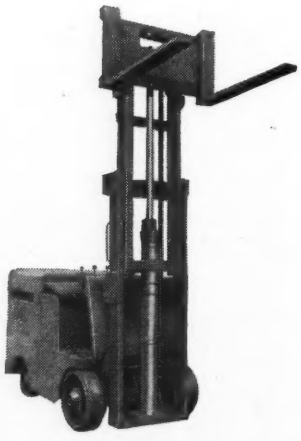
- Minimum maintenance costs.

This is the truck to take loads off your mind.



ELECTRIC Crescent PALLETIER

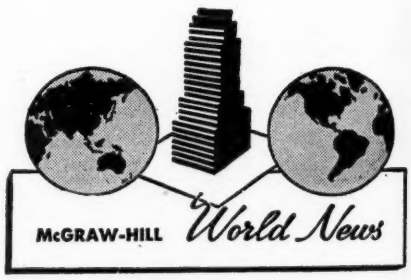
tinued at this level to encourage producers to harvest 11,244,000 acres of 1947-crop soybeans, the goal acreage that was announced by the Department of Agriculture on January 14.

Canned Bean Standards

CANNED green and wax beans will be covered by standards of identity and quality from the 20th of May, in accordance with the Food and Drug Administration order published in the Federal Register February 19. The new standards provide for all styles and packs of both green beans and wax beans. Provision for labeling of substandard quality beans is also covered.

Merger Delayed

STOCKHOLDERS of Froedtert Grain & Malting Company, Inc., and Rockwood & Co. have been advised that action is being held in abeyance on the proposal to merge the two companies that was announced on January 20, due to the objections from certain minority stockholders of Rockwood & Co.



Look to 1948 Exports Of Philippine Sugar

MANILA—The Philippines will reenter the sugar export field in the 1947-48 crop year, according to Remigio Abello of the Philippine Sugar Administration. By the beginning of the second quarter of 1948 the Philippines will be able to furnish 150,000 short tons for the world markets; and in the following season, the Philippines will be producing a full 850,000 long tons for United States use, allowed by the Bell Trade Relations Act, with a substantial surplus available for export to other countries, Abello said.

Abello further reported that 16 centrals grinding cane in Luzon, Negros, and Leyte this season will produce only 80,000 short tons, which is 70,000 tons under the total required for domestic consumption. Abello's optimistic report has caused the government to drop the plan for commandeering 75 percent

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of the crop to ensure the government rationing agency having a sufficient supply for local distribution next year.

Sugar prices in Manila's black market dropped below the government ceiling price in January for the first time since the war.

Siberian Cultivation Expanded by Russians

MOSCOW—A three-year land development program that surpasses anything yet undertaken in the eastern areas of the Soviet Union over a comparable period of time has been launched by the USSR Ministry of Agriculture, in line with the government decision to open up to agriculture between 1947 and 1949 as much as 8,000,000 hectares (20,000,000 acres) of virgin soil and abandoned farm land there, chiefly in Siberia.

Some 6,500,000 hectares (16,250,000 acres) of the new farm land is to be put under grains, chiefly spring wheat, in view of the good harvests obtained from these crops on Siberian soil. Industrial crops and vegetables are to be planted on the remainder. This year should see a third of the entire program completed.

This is only part of the vast expanses of virgin soil and abandoned farm land now lying idle in Siberia and other eastern areas to be opened up to agriculture in the future.

Mexican Storage

MEXICO CITY — A refrigeration plant, to cost approximately $200,000, is planned by the largest wholesale and retail produce market in Mexico City. An auxiliary Diesel power plant is to be installed.

Materials and machinery needed for the plant are reportedly free from import duties as well as from taxes of the federal district and the national government. The plant is to have a capacity to handle 3,000 tons of foodstuffs.

Copra Output

BATAVIA—Netherlands Indies 1946 copra production totaled 110,000 tons, 54,000 tons of which were exported, according to figures released by the Netherlands Indies government Copra Organization. Stocks on hand for export as of Jan. 1 amounted to 50,000 tons. Exports for 1947 were estimated at 200,000 tons and consumption within the Indies at 50,000 tons.

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Java Sugar

BATAVIA—Approximately 1,500,000 tons of sugar exist at present in the interior of Java, compared with some 2,300,000 tons (1,500,000 on estates and 800,000 in the hands of Chinese traders) at the time of the Japanese capitulation, according to official Netherlands Indies government estimates made public recently. The estimates also stated that 1947 production would not exceed 25,000 tons, and that even in 1949, under the most favorable circumstances, no more than 1,000,000 tons could be produced. According to Indonesian figures, total 1946 production was placed at 20,000 tons.

SCHEDULE OF EVENTS

April

8-11—American Management Association, 16th annual packaging exposition and conference, Convention Hall, Philadelphia.

10—University of Wisconsin, dairy manufacturers conference, Madison, Wis.

10-11—Tri-State Packers Assoc., spring convention, Lord Baltimore Hotel, Baltimore, Md.

14-16—National Fisheries Institute, annual convention, Waldorf-Astoria, New York.

14-18—American Chemical Society, 111th national meeting, Atlantic City, N. J.

21-23—American Dry Milk Institute, convention, Edgewater Beach Hotel, Chicago.

29-May 1—Industrial Packaging Engineers Association of America, second annual industrial packaging and materials handling exposition, Sherman Hotel, Chicago.

May

5-7—Millers National Federation, 45th annual convention, Edgewater Beach Hotel, Chicago.

6—National Cheese Institute, annual meeting, Hotel La Salle, Chicago.

6-10—The Society of the Plastics Industry, 2nd national plastics exposition, Coliseum, Chicago.

12-16—Society of American Bacteriologists, 47th annual meeting, Philadelphia, Pa.

19-23—American Association of Cereal Chemists, 32nd annual meeting, Hotel President, Kansas City, Mo.

20-22—American Oil Chemists Society, 38th annual meeting, Roosevelt Hotel, New Orleans, La.

25-29—National Confectioners Association, 64th annual convention, Stevens Hotel, Chicago.

26-28—Flavoring Extract Manufacturers Assoc., annual convention, Traymore Hotel, Atlantic City, N. J.

26-28—American Society of Brewing Chemists, annual spring meeting, Hotel Roosevelt, New York.

26-29—National Confectioners Association, convention and exposition, Hotel Stevens, Chicago.

June

2-4—Institute of Food Technologists, 7th annual convention, Hotel Statler, Boston.

2-6—Association of Operative Millers, annual convention, Nicollet Hotel, Minneapolis, Minn.

8-10—Bakers Association of the Carolinas, annual convention, Grove Park Inn, Asheville, N. C.

9-10—Grocery Manufacturers of America, mid-year meeting, Skytop, Pa.

9-11—Eastern States Frozen Food Locker Association, 1st convention, Hotel New Yorker, New York.

15-18—National Candy Wholesalers Association, 2nd annual convention, Sherman Hotel, Chicago.

15-19—National Dairy Council, summer conference, Edgewater Beach Hotel, Chicago.

16-19—American Society of Mechanical Engineers, semi-annual meeting, Stevens Hotel, Chicago.

Changes in Food Supplies

(Indicators)

Materials

Chicks hatched, in January, showed a 20 percent increase over a year earlier. Total production came to 54,493,000 compared with 45,404,000 during January, 1946.

Egg production in January, estimated at 4,468,000,000, was 6 percent higher than in January, 1946 and 48 percent above the 1936-45 average.

Storage

Freezer occupancy dropped 1 point during January and stood at 85 percent on February 1. Cooler space was 64 percent filled on February 1, compared with 69 percent a month earlier.

Frozen fish and shellfish holdings totaled 127,118,993 lb., February 1, which compares with 115,397,766 held on Feb. 1, 1946. This was a decline of 17 percent from the holdings of the previous month.

Production

Flour production by mills reporting to the *Northwestern Miller*, in February, came to 15,767,612 sacks, a decrease of 2,108,439 sacks from January. It is also 174,451 fewer sacks than was produced in February, 1946. These mills represent approximately 67 percent of the total flour production.

Canned evaporated milk production is estimated at 206,300,000 lb., for January, a gain of 14 percent from a year earlier, but 9 percent less than the five-year January average.

Canned condensed milk was down 15 percent from a year earlier, reaching 7,440,000 lb., in January. This was a 10 percent seasonal gain from December, which compares with a five-year average decline of about 5 percent.

Creamery butter production in January, estimated at 97,295,000 lb., gained 9 percent from December. Production was 40 percent higher than in January, 1946.

American cheese production in January, was 25 percent larger than the corresponding month last year. Estimated at 55,719,000 lb., it was about 16 percent above the five-year average for the month and, except for 1942, was at the highest level ever recorded for the month.

Tomatoes packed in 1946 came to 23,857,000 cases, on a 24/2's basis, which compares with 16,758,000 cases packed in 1945, according to the National Canners Association.

Frozen fruit and frozen vegetable packs for 1946 were estimated, recently, by the National Association of Frozen Food Packers, as follows:

Item	1945	Preliminary Estimate 1946
	lb.	
Fruits		
Apricots	65,158,052	39,511,629
R.S.P. Cherries	16,143,827	86,642,106
Strawberries ..	36,916,743	73,320,236
Peaches	103,634,388	55,330,317
Vegetables		
Asparagus	20,637,590	22,887,752
Peas	103,833,553	131,339,705
Cut Corn	25,551,336	33,550,136

Lard production reached 199,206,000 lb. in January, which compares with 160,410,000 lb. during December.

Meat production for the first quarter is expected to be about 9 percent above that of a year earlier, and about 39 percent above the prewar average.

Green beans packed in 1946, reached 16,217,577 on a 24/2's basis, in the National Canners Association compilation. This compares with 16,012,000 cases packed in 1945. Wax beans totaled 1,885,615 cases, in 1946, compared with 1,353,000 in 1945.

Indexes

Business Week's index of business activity reached 193.3 for the week ending March 8. This compares with 193.4 for the preceding week, 190.2 a month ago, and 163.8 a year ago.

The commodity price index on food, compiled by the New York Journal of Commerce, stood at 193.7 for the week ending March 15, a drop from the 199.7 recorded the previous week, but above the 187.9 for the month of February. The March, 1946, compilation came to 113.1.

CONSTRUCTION NEWS

	Pending (thousands)	Total Awarded— March (thousands)	Total Awarded— 1947 (thousands)
Bakery	$ 510	$1,745	$ 4,148
Beverages	3,285	220	1,494
Canning and Preserving	700	....	130
Cold Storage	847	....	1,251
Confectionery	3,565	....	449
Grain Mill Products	225	352	1,572
Ice, Manufactured.	....	....	55
Meats and Meat Products	918	120	370
Milk Products	2,170	342	1,670
Miscellaneous	1,355	235	2,660
	$13,575	$3,014	$13,799

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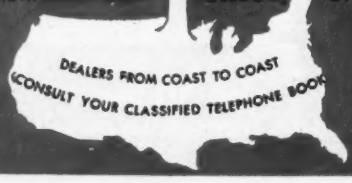

What Washington Thinks

By R. S. McBRIDE, Washington, D. C.

SALMON BYPRODUCTS — One of the first efforts of Industrial Research and Development Division in Office of Technical Services to encourage food-industry development projects by contract is with Alaskan salmon fishery groups. A research contract contemplates development of effective methods to convert salmon wastes into profitable byproducts. If successful processes become available, they can be utilized on about 110,000,000 lb. of fish wastes available at a relatively few salmon canneries.

PERENNIAL PROPOSAL — Stream pollution prevention or control is the subject of legislation again actively before Congress. The proposals are of two groups, one for exploration, the other for active policing, but both assuming Public Health Service administration if a law is passed.

FERMENTATION RESEARCH—Investigations of Northern Regional Research Laboratory in the field of fermentation have again been set back by the resignation of another important leader of these investigations. As a consequence the bureau is looking for additional personnel in this field. This is but one of the many areas in which Uncle Sam is having trouble in keeping personnel because industry "buys them away."

TARIFF COMPROMISE—By a deft action President Truman has practically eliminated the prospect of Congressional action limiting tariff cuts during pending international trade agreement negotiations. The President, by executive order, made it mandatory that all new trade agreements must include an escape clause which would provide for suspending our tariff concessions if the result proved to be highly detrimental to any American industry. Also required is a provision that the Tariff Commission shall review all new proposals and all present agreements to catch promptly, and recommend correction, of effects detrimental to American business. Washington expects less sweeping tariff cuts than might have been granted; but the early conclusion of numerous agreements is generally forecast within this new Presidential order.

PATENT IMPROVEMENTS—A patent owner who licenses others to use an invention may legally require them, as a consideration in the use of his patent, to deliver to him exclusive control of any patent improvements that they make. This is the finding of the U. S. Supreme Court in a five to four decision announced recently. The decision has caused surprised comment because it is one of the few cases in which the Supreme Court by any decision has tended to strengthen the patent system.

PEST WARNINGS — Warning of prospective blight or other pest damage to the tomato crop is promised by U. S. Department of Agriculture. Through its plant disease survey this agency will distribute weekly bulletins in cooperating states enabling tomato growers and tomato-products packers to take prompt pest-control action if blight or other attack threatens the crop unexpectedly.

THE LIST SHRINKS — The list of scarce commodities announced monthly by U. S. Department of Agriculture has been shrinking regularly each month. This has, of course, automatically reduced the number of commodities for which OPA controls were permissible. Even as early as February it became evident in Washington that the department would take over management of any of these scarce items for which federal controls were deemed still necessary, as OPA passes out of the picture. Sugar and rice, for example, will not be entirely decontrolled; but the continuing official management will be under USDA.

FOOD LIMITED—International Emergency Food Council states categorically that the production of food

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throughout the world is definitely limited by lack of fertilizer supply. Thus it is anticipated that continuing controls will be exercised over nitrogen, phosphate, and potash in order to have a minimum hunger factor resulting from distorted fertilizer distribution. Those seeking larger fertilizer supplies for crops to be processed in food plants will have to look in last analysis to these international controls. Actual distribution within the United States is, however, now largely free from official management.

FAT RENDERING — Fat rendering will be a much more closely regulated industry under proposed fair trade practice rules being formulated by Federal Trade Commission. The first step in the proceedings was a hearing begun in St. Louis, late in February. The main result of that conference will be a tentative draft of rules, which will be promulgated for criticism, probably during this spring or summer.

RIBOFLAVIN COMPETITION—Food technology got another sharp prod from synthetic chemistry recently. Formerly riboflavin was available most extensively as a natural component of milk products, but the synthetic product began to replace the natural, as it was cheaper. This has led the Bureau of Dairy Industry to develop new fermentation control methods to be used with whey from which riboflavin yield is about 50 times that of the older careless methods. Bureau officials hope that this may restore competitive opportunity to the natural resources of riboflavin.

RESEARCH FOUNDATION—A National Science Foundation is again urged on Congress by science leaders and top government executives including the President. One of the large hurdles preventing quick enactment of a law setting up such a unit is the need for funds to support a Foundation, if established. Economy minded Congressmen are reluctant to vote for new projects, which require multi-million dollar spending, just at a time when they are struggling with the need for economy as a whole. It's anybody's guess whether Science Foundation will get approval this year.

VITAMIN WASTES—Several million tons of valuable vegetable matter are wasting annually, principally at food processing plants, in the view of Department of Agriculture food technologists. These government men urge that this material "rich in protein, carotene, and riboflavin" be dried and ground to become a valuable feed component. Extensive experimental work indicates that such processing, properly planned and done promptly, will give a very valuable byproduct often worth much more in the feed market than its cost.

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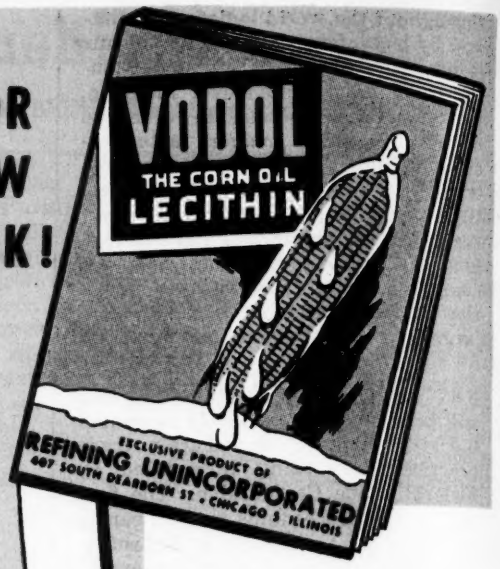

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INDUSTRY

The Autauga Canning Co., Inc., has been organized in Plattville, Ala., and will begin operations this season. Officers of the new company are: W. E. Cooper, president; George Yarbrough, Jack Wadsworth and Colly Smith, vice-presidents and John Freeman, secretary-treasurer.

Campbell Soup Co., Chicago, has begun construction of a 165-acre experimental farm north of Wheaton, Ill. The unit includes four concrete block structures. About 250,000 lb. of mushrooms will be grown during the first year to discover better varieties and strains for processing. Experimental plantings of tomatoes, parsley, parsnips, asparagus and carrots also will be made this spring. A laboratory will be set up later to service the growers in the area.

Central Soya Co., Inc., Fort Wayne, Ind., has purchased control of the International Sugar Feed Co. of Tennessee, Memphis, Tenn. Central Soya has begun a $500,000 modernization and expansion program at the Memphis mills.

Corn Products Refining Co. has broken ground for its new processing plant in Corpus Christi, Tex. The unit, expected to be completed in time for the 1948 crop, will manufacture starch and sugar from milo maize.

Fairmont Creamery Co., Omaha, recently has completed construction of a two-story brick, tile and glass block ice cream plant. The new facilities will have production capacity of 1,000,000 gallons of ice cream yearly.

Walter H. Johnson Candy Co., Chicago, has completed its new $1,000,000 confectionery plant and expects to begin operations in May.

Leaf Gum Co. and Overland Candy Corp. have merged to form Leaf Brands, Inc., Chicago.

The Miner Laboratories has announced the addition of an entomological division to its facilities. Dr. Barbara Miner Parker will head the division which will be equipped to handle research in connection with stored cereal products.

National Soup Mix Association, Chicago, has elected A. Irving Grass as president.

Polar Frosted Foods, Inc., Seattle, formerly S. A. Moffett Co., Inc., has completed a $650,000 improvement program at its Mount Vernon, Grandview and Seattle, Wash., plants. Total freezing capacity has been increased to 260 tons per day.

WILLIAM T. BRADY

Assistant to the president of Corn Products Refining Co., New York, William T. Brady has been elected a vice-president of the company.

ROBERT ROSENBAUM

Dairy Industries Supply Association has re-elected Robert Rosenbaum as president for 1947. Mr. Rosenbaum is with David Michael & Co., Philadelphia.

Stein Hall & Co., Inc., importer and manufacturer of industrial commodities, announces the opening of a New York sales branch office in the Empire State Building, New York. The branch will be under the direction of C. J. Dunachie.

Southern Warehouse Co., Alvin, Tex., has begun construction on a $50,000 expansion to its warehouse and dryer. Additions will include 16 more bins on the drier and a sprinkling system for the entire building.

Tennessee-Dairies of Dallas has increased its facilities for processing dairy products by additions to its receiving, pasteurizing, homogenizing, cooling and bottling equipment. Tennessee Dairies' manufacturing plant at Decatur, Tex., is installing a new stainless steel evaporator plant for condensing milk.

The Vieux Carre Canning Co., New Orleans, is operating its new plant which produces a line of canned seafood specialties under the brand name "Vieux-Carre." Charles F. Read is manager of the plant.

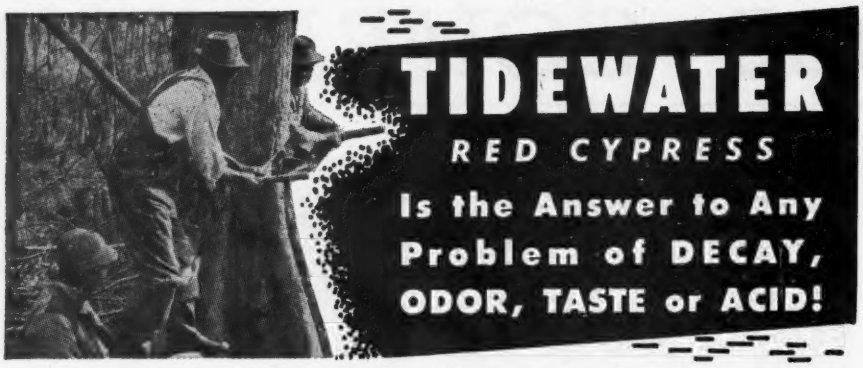
Washington Food Co., Cary, N. C., will begin construction in the near future of a $160,000 food packing plant between Raleigh and Cary.

West Tennessee Soya Mills, Inc., Tiptonville, Tenn., has purchased the $300,000 solvent oil extraction plant of Allis Chalmers Mfg. Co., Milwaukee. The mill will process 150 tons of soybeans daily. T. C. Pinckney is general manager of West Tennessee Soya Mills.

Zero Products, Inc., plans the construction of a $70,000 food processing plant and storage room at Chattanooga, Tenn., for processing, packaging, and sale of frozen foods. The new plant will be built on property adjoining the company's present plant.

FREDERICK J. BATES

Noted sugar physicist at the National Bureau of Standards, Frederick J. Bates has retired after more than 43 years of service. He is an authority in the application of natural and magnetic polarization measurements to sugar tests, and it was he who devised the methods and prepared the treasury regulations for weighing, sampling, classifying and testing imported sugars.



...Its Superior Qualities Make It Ideal for a Wide Range of Industrial Uses

The Indians knew it, the Spaniards knew it, the French knew it, and those of English decent of the Southeastern regions have known for 150 years the superior qualities of Tidewater Red Cypress and its resistance to decay. Along the Atlantic Coastal Plain where lie buried cypress trees that grew over 100,000 years ago in the Pleistocene Age, many of which have since been dug up, give mute evidence of the lasting qualities of cypress never equalled for its decay resistance. In more recent years industry has also learned that it licks the difficulties of odor, taste and acid. Tidewater Red Cypress has ALL the qualities you demand for many specific industrial demands.

Tidewater RED CYPRESS

The Tidewater Red Cypress "The Wood Eternal"

CAN BE FURNISHED FROM ST. LOUIS STOCKS

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One of the South's leading Cold and Freezer storage warehouses. Write for fully illustrated folder.

Roanoke Ice & Cold Storage

ROANOKE, VIRGINIA

PERSONNEL

J. S. Armstrong, general purchasing agent for Cudahy Packing Co., Chicago, has been elected vice-president, succeeding the late Charles J. Carney.

C. P. Binner, formerly director of advertising for Brunswick-Balke-Collender Co., Chicago, recently was elected president of the American Bakers Association.

W. P. Bomar, president, Bewley Mills, Fort Worth, Tex., has been nominated for re-election as president of the Millers National Federation.

Raymond L. Brang, assistant director of grocery products operations, General Mills, Inc., Minneapolis, recently was elected a vice-president of the company.

Dr. Robert E. Buck is the new chief, Fruit and Vegetable Products Section, Quartermaster Food and Container Institute for the Armed Forces, Chicago. Dr. Buck formerly was research chemist at the U. S. Dept. of Agriculture's Eastern Regional Laboratory at Philadelphia.

Charles P. Carroll, former manager of Swift & Company's dairy and poultry plant at Macon, Ga., and West Point, Miss., has been named manager of the company's dairy and poultry plant at Marion, Ind. He succeeds Louis R. Kells, who retired.

Curtis H. Gager, vice-president since 1943, has been elected a director of General Foods Corp. Mr. Gager formerly headed the company's Walter Baker Chocolate and Cocoa Div., and now has charge of the operations of eight General Foods divisions.

Mary B. Horton has been appointed to direct the activities of the Sealtest Laboratory Kitchen, according to an announcement by National Dairy Products Corp., the parent company. Mrs. Horton formerly was chief bacteriologist and educational director for Sheffield Farms.

Milton Hult has been re-elected president of the National Dairy Council for his 11th consecutive term. Other officers elected include: first vice-president, W. A. Wentworth, The Borden Co., New York; second vice-president, John W. Ladd, Cherry-Burrell Corp., Chicago; secretary, Wilbur Carlson, Kraft Foods Co., Chicago; treasurer, G. A. Wallis, Creamery Package Co., Chicago. E. W. Tiedeman, manager of the Central Grade A Co-op, Appleton, Wis., is chairman of the executive committee of the board of directors.

Dr. Robert S. Ingols, formerly with

Women vote 2 to 1 for fruit cocktail or fruit salad in glass — just another example of the great and growing swing to glass!

One Look...

and she's sold!

You can sell more of your product only if the *retailer* sells more. And more traffic, faster turnover, are the only offsets in sight for his increased costs.

So what do consumers *want?* How can he make them buy *more?*

Mrs. Housewife wants first of all to SEE before she buys. And sight is the greatest builder known for *extra* sales, *impulse* sales.

She buys more . . . buys faster. And the grocer's selling time is saved when the product has the chance to sell *itself.*

Duraglas
TRADE MARK REG. U.S. PAT. OFF.

CONTAINERS • SELL ON SIGHT

OWENS-ILLINOIS GLASS COMPANY

TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

Plagued by Pests?

Try WESTVACO METHYL BROMIDE *plus* WESTVACO SERVICE TO SOLVE YOUR PROBLEM!

One meeting with our experts and your pest problem has reached the beginning of the end!

Without obligation, they will inspect your plant, trace the sources of infestation, and recommend competent industrial fumigators skilled in the use of Westvaco Methyl Bromide and Westvaco "spot" fumigants.

They will outline a program of pest elimination specifically for your property and your product. They will help your employees keep your plant infestation-free!

☆ ☆ ☆

Write or phone our Agricultural Chemicals Division today . . . and be among the many to benefit from this practical and comprehensive Westvaco service!

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GREENVILLE, S.C. • ST. LOUIS, MO.
LOS ANGELES, CALIF. • NEWARK, CALIF.

the Florida Citrus Commission, has been named research associate professor of sanitary chemistry at Georgia Tech.

Dr. A. F. Langlykke, who has headed the fermentation investigations of the Peoria Regional Laboratory, has resigned to take up a research project with the Squibb Institute for Medical Research, New Brunswick, N. J.

Col. Charles S. Lawrence, commanding officer, Quartermaster Food and Container Institute, Chicago, has been awarded the Bronze Star Medal with Oak Leaf Cluster in recognition of outstanding and courageous action against the Japanese during the siege of Bataan in April, 1942.

Joseph Levitt, mechanical engineer, formerly with Schwarz Laboratories, Inc., is now research assistant, engineering experiment station, Pennsylvania State College.

Richard W. Moulton, director of the New England Confectionery Co., in charge of manufacturing, is treasurer of Human Relations, Inc., a newly organized business and industry service in Boston.

Martin S. Peterson, formerly technical editor at the Dept. of Agriculture's Western Regional Research Laboratory, Albany, Calif., has been appointed chief of the Public Relations Branch, Quartermaster Food and Container Institute, Chicago.

Joseph W. Pinter, formerly vice-president and general manager of Phenix Pabst-ett Co., Chicago, has been elected president and continues as general manager.

Earl Price, former manager of the pickle and condiment sales division, Libby, McNeill & Libby, Chicago, has been elected a vice-president of the company.

J. Van Rogers, Jr., has been appointed southeastern field representative of the National Cottonseed Products Assoc. for Georgia, South Carolina, North Carolina, Alabama and Florida.

S. C. Satterthwait, former president of Red Rock Bottlers, Inc., has been elected chairman of the board of the company. L. N. Conrad succeeds him as president.

Ralph Ward has been appointed general manager of the Columbia Baking Co., Atlanta, Ga. He formerly was assistant to the president, Joseph Hexter.

Glenn P. Wheeler, formerly with the B. F. Goodrich Co., has joined the staff of Southern Research Institute, Birmingham, Ala.

CASE HISTORY No. 14

One in a series of factual experiences of a group of American manufacturers with Multiwall Paper Bags.

COST COMPARISON (Per Ton)

CLASS OF PRODUCT PACKED

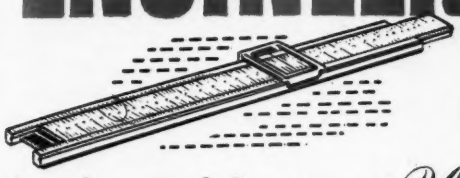
CEMENT	FERTILIZER
CHEMICALS ✓	FOOD
FEEDSTUFFS	MISCELLANEOUS

PRODUCT CHARACTERISTICS

ABRASIVE	GRANULAR
CORROSIVE	HEAVY
DELIQUESCENT	HYGROSCOPIC
FLUFFY ✓	LIGHT ✓
FREE-FLOWING	VISCOUS

ST. REGIS PACKAGING SYSTEMS are designed to meet a wide range of product requirements and plant layouts. Packers are available in a variety of sizes and types, with filling speeds as high as twenty-four 100-lb. bags per minute—with one operator. Nearly 400 commodities—rock products, fertilizers, chemicals, foods, and feeds—are now being packaged in sturdy, low-cost multiwall paper bags.

ENGINEERED PACKAGING



returns substantial saving

for chemical division of *United States Rubber Company*

In the Naugatuck Chemical division of United States Rubber Company packaging methods are carefully engineered. Continuous cost studies make certain that packaging output and labor and container costs meet strict standards of efficiency and economy.

A few years ago company engineers noted a steady rise in the cost of packing in fibre drums of two high-priced chemicals — anti-oxidants and accelerators used in rubber compounding.

After a thorough investigation of packaging costs the company installed two St. Regis 100-LS bag-filling machines at its Naugatuck, Conn. plant and switched to 50-lb. multiwall paper valve bags. Soon after, analytical cost studies disclosed these results:

- **Reduced container costs per ton of material packed**
- **Reduced man hours required to pack, handle, and store the material**
- **50% to 70% reduction in over-all packaging costs**

In addition, company engineers reported that Multiwalls gave efficient protection against contamination of these expensive chemicals . . . reduced dust in packaging . . . saved storage space . . . and won general acceptance from customers.

This case history is another striking example of how St. Regis Packaging Systems provide efficient and economical packaging. For complete details, mail the coupon for free copies of an illustrated folder.

LEFT: *Only one operator is required for each valve bag packing machine.*

ABOVE: *Filled Multiwall bags stacked in the company's warehouse.*

St. Regis MULTIWALL PAPER BAGS

ST. REGIS SALES CORPORATION
(Sales Subsidiary of St. Regis Paper Company)

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 1925 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.
ALLENTOWN, PA.: 202 Penn Bldg.

Mail this coupon for the complete story

OFFICES IN OTHER PRINCIPAL CITIES — IN CANADA: ST. REGIS PAPER CO. (CAN.) LTD., MONTREAL, VANCOUVER

Without obligation, please send me full details regarding "Case History" No. 14 outlined above.

NAME_____

COMPANY_____

ADDRESS_____

WHY
CARRY
WHEN YOU
CAN
CONVEY

Carrying material around is not only slow, hard work — it's costly material handling — there's an easy way to do it.

Investigate the use of conveyors. Conveyors handle a wide variety of parts, packages, barrels, bundles, boxes, bales and cases. Available in light, medium or heavy-duty types — portable or stationary — as systems, sections or units — power or gravity fed, they give you remarkable savings in time, money and manpower conservation. They relieve confusion and congestion.

Standard Conveyor Company has the experience and facilities to engineer, recommend and furnish the right type of conveyor for your particular needs.

Write today for catalog No. FI-47 "Conveyors by Standard" — a ready reference on conveyor types and systems.

STANDARD CONVEYOR CO.
General Offices: North St. Paul 9, Minn.
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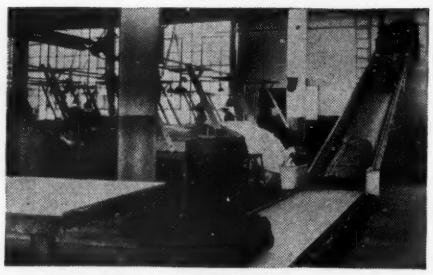
RAW STOCK RECEIVING
Bundles, bags or cases can be unloaded and piled with equal ease by conveyors.



INTERMILL HANDLING
There's a Standard Conveyor for almost any circumstance of material transfer from one department to another.

CRATING AND SHIPPING
Boxes and crates may be loaded and sealed for shipment while moving on conveyors — then delivered by same conveyor to shipping platform.

ROLLER - BELT - SLAT - PUSHBAR CONVEYORS • PORTABLE CONVEYORS AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS

DEATHS

Calvin Grant Church, 68, USDA sugar chemist, Los Angeles, February 27.

William A. Barnes, 66, vice-president and secretary, Wheeler-Barnes Co., Minneapolis, January 30.

Norman C. Fischer, 50, manager of technical production, dairy and poultry division, Armour and Co., Chicago, February 5.

James W. Lawrie, 65, director of research, Jos. Schlitz Brewing Co., Milwaukee, January 14.

Roy E. Pirie, 51, secretary-treasurer of Carstens Packing Co., Tacoma, Wash., January 21.

ASSOCIATED INDUSTRIES

Arkell and Smiths, Canajoharie, N. Y., announces the election of Sheldon S. Yates as chairman of the board of directors.

The Bristol Co., Waterbury, Conn., has announced the appointment of H. E. Beane as general sales manager.

Cherry-Burrell Corp., Chicago, has elected John C. Cherry a vice-president of the company. He is assistant manager of production.

The M. W. Kellogg Co., Jersey City, N. J., has announced the appointment of Gen. J. C. Marshall to its engineering staff.

Owens-Illinois Glass Co., Toledo, Ohio, has announced the appointments of Northrup F. Bowes as eastern sales promotion manager and Newell A. Pontet as manager of the film and display division.

Norton Company, Worcester, Mass., has purchased the assets of The Oslund Bros. Machine Co., Inc., and will continue to produce the Oslund labeling equipment for the food, beverage, cosmetic and drug industries.

Pneumatic Scale Corp., Ltd., has made known the election of William H. Doble as chairman of the board of directors. He is succeeded as president by his son, Kendall D. Doble.

Tomotor Corp., Cleveland, has completed a new building providing 33,000 additional square feet for final and final sub-assembly lines, as well as dock loading space for outgoing freight cars and motor trucks.

Minneapolis - Honeywell Regulator Co., Minneapolis, has elected L. M. Morley as vice-president.

Speed WITH PRECISION

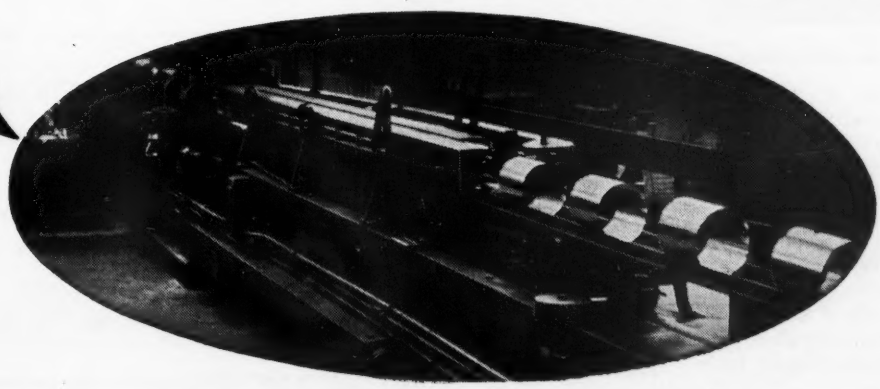
Today one machine makes three times as many cans in a minute as a man formerly made in a day—and they are better cans.

Crown Personalized Service has kept pace with the precision of production. Buy Crown Cans and you buy cans plus this service.

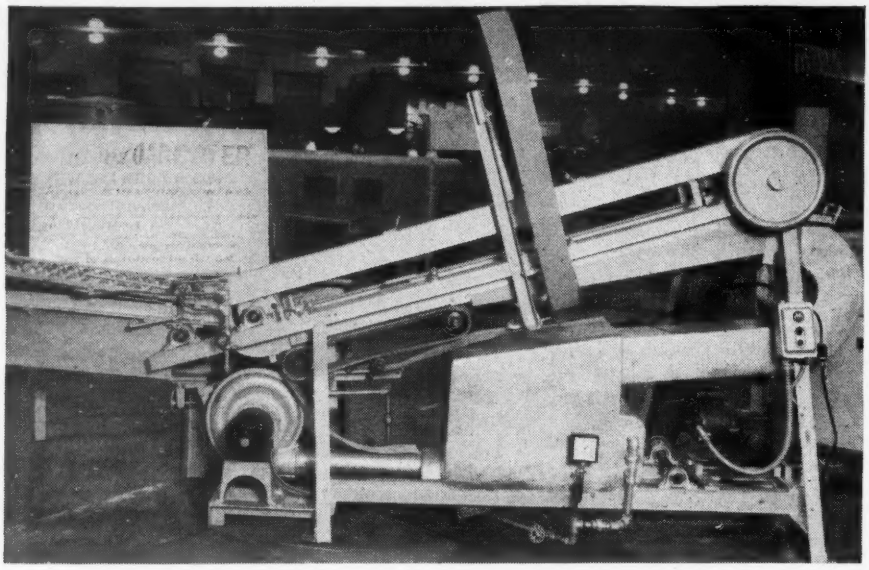
CROWN CAN

THE NATION'S THIRD LARGE SOURCE OF SUPPLY

CROWN CAN COMPANY • PHILADELPHIA • Baltimore • Chicago • St. Louis • Houston • Orlando • Fort Wayne • Nebraska City



FOOD EQUIPMENT NEWS



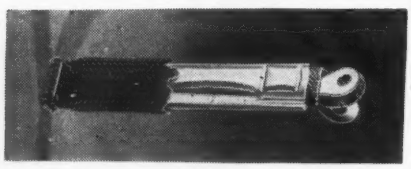
Machine dries cold wet jars at the rate of 300 per min.

Jar Drier 1

AN improved drier, that was developed to overcome labeling difficulties encountered when products were cooled after processing in glass containers, has been introduced by Hartford-Empire Co., Dept. I, Hartford 1, Conn. It has a capacity of 300 jars per min. Wet jars are first exposed to a blast of air that removes the excess water. They then pass over blotting paper and through a hot air tunnel. When they leave the tunnel the jars are dry and warm on the outside.

Thermostat 2

DESIGNED for applications calling for a miniature thermostat with great load-carrying capacity is the new "Master Mite" announced by Mechanical Industries Production Co., Dept. I, 224 Ash St., Akron 3, Ohio. Rated for use to 1,500 watts at either 110



"Master Mite" miniature thermostat.

or 220 volts a.c., it is furnished preset up to a temperature range of 550 deg. F. Among its advantages is a substantially improved accuracy of operation even under extreme overshooting or undershooting of temperature. Exceptionally long point life has also been obtained by a slight wiping action of the fine silver points. It is completely jacketed in aluminum, copper, or nickel and is insulated with silicon impregnated fiber-glass. It is moistureproof, dustproof, tamperproof, and adaptable to immersion in liquids. It has wide applications in the electrical and industrial fields for air conditioning and refrigeration equipment.

Retort Cover Actuator 3

A COMPACT hydraulic unit for raising and lowering retort covers has been developed by John S. Barnes Corp., Dept. I, Rockford, Ill. It is combined with a simple manual valve and a cylinder. When the operator pulls the valve handle the cover swings up in less than 4 sec. and remains open until he pushes the valve handle back. It then descends swiftly. A single unit will handle a bank of 6 to 8 retorts.

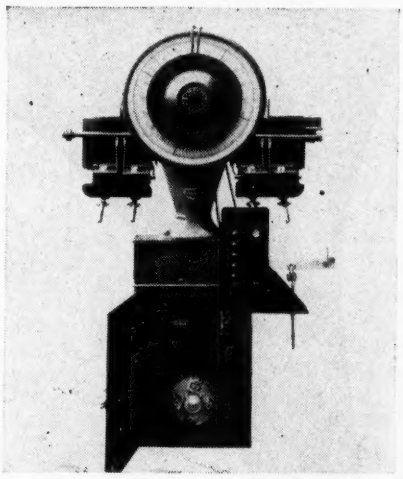
Water Clarifier 4

WATER treatment applications in the coagulation of turbid and colored waters, the softening of hard well waters, or the simultaneous softening and clarifying of hard river waters, can all be accomplished, it is claimed, in a new clarifier introduced by Liquid Conditioning Corp., Dept. I, 423 West 126th St., New York 27, N. Y. This clarifier precipitates impurities through chemical treatment in the form of a sludge.

The coagulating and softening chemicals are positively recirculated. Settling out and depositing of sludge on the floor of the tank is prevented by a large, slow moving agitator which operates over the entire bottom of the tank. Clarified water is separated from the sludge by horizontal outward radial flow, with gradually decreasing, velocity. This method is said to permit the use of smaller diameter tanks than in clarifiers employing up-flow through the sludge blanket. A sludge concentrator is provided to collect and considerably thicken some of the sludge for blow-off by automatic desludging, thus keeping the top of the suspended sludge at the optimum level for best chemical results consistent with the clear effluent.

Weigh Batcher 5

AN improved automatic weigh batcher, which weighs any number of free-flowing, dry ingredients to predetermined weights, has been developed by



Improved automatic weigh batcher.

The Conveyor Company, Dept. I, Los Angeles, Calif. A new principle, in which a single photo-electric cell is used to activate mechanisms which

WRITE FOR MORE INFORMATION

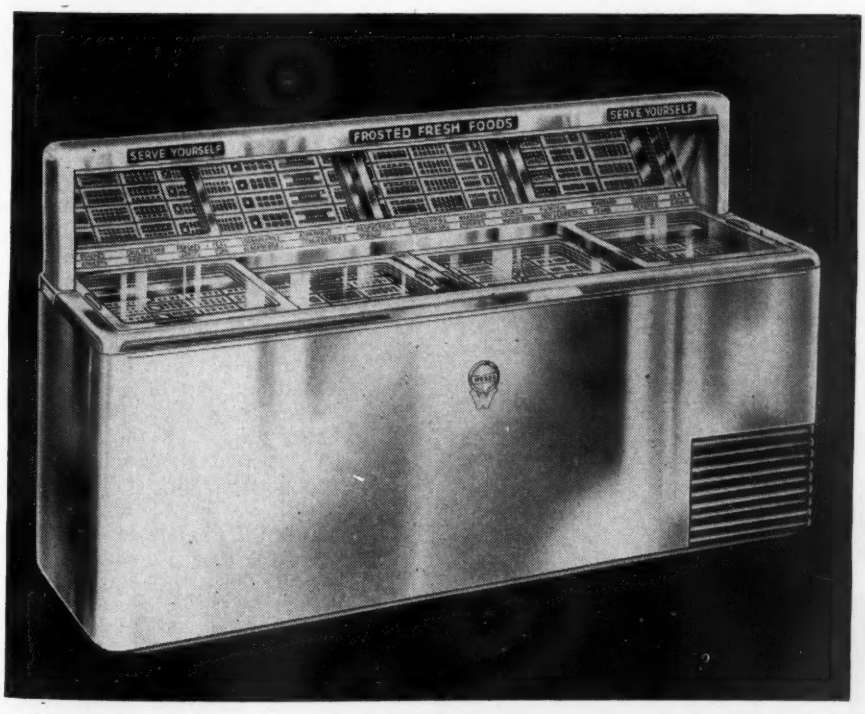
Food Industries Reader Service now makes it easy for you to follow up the news on new equipment and new materials. Tear-out coupon cards are supplied for your convenience on the special colored page which follows the equipment news section in this month's issue. Enter your requests, fill out and mail cards, and let Reader Service do the rest.

open and close the bin gates and precisely weigh each ingredient, is incorporated in this equipment.

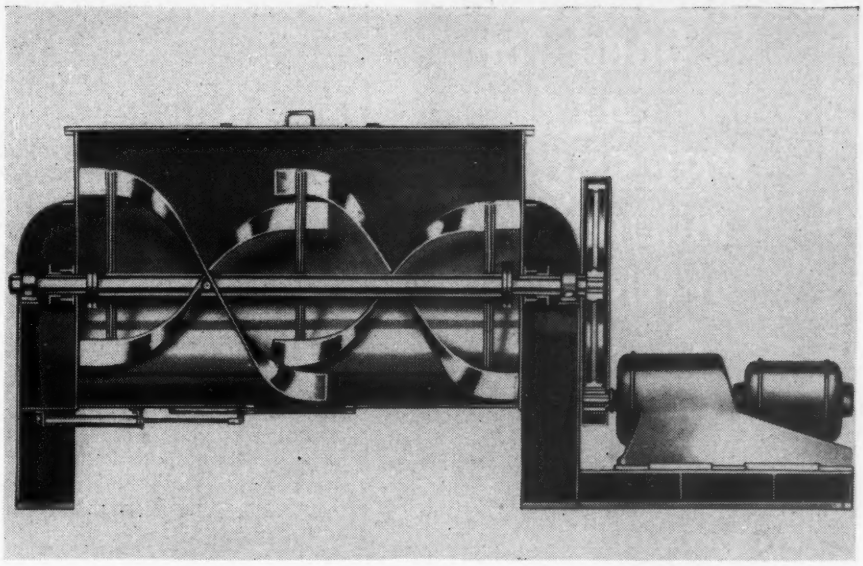
The Conveyco Weigh Batcher has many uses in food, chemical, and industrial plants. It is designed around a nationally-known dial scale which operates automatically through the use of one photo-electric cell. Movable contact lights, which can be placed at any point on the dial to correspond with predetermined weights, shoot a beam to the photo-electric cell as the hand of the scale sweeps around to each of these contact points. This activates a mechanism that closes the bin gate which has just discharged an ingredient and simultaneously opens the next gate, thus weighing out desired quantities of each material. This process continues automatically until all materials have been batched. The equipment automatically resets itself and the operator has only to push a button to repeat the cycle. It is capable of operating at a rate of 22 sec. per batch. The units are easily adapted to a variety of weighing conditions and specific problems.

Frozen Foods Cabinets 6

STAINLESS steel frozen food cabinets with a rolling-door feature are manufactured by Weber Showcase & Fixture Co., Inc., Dept. I, Los Angeles, Calif. They are equipped with either stainless steel solid doors or thermopane glass doors. Models with display mirrored superstructures and glass doors provide an attractive merchandise display feature. In addition to maintaining zero temperature protection, the Roll-A-Door top provides easy access to merchandise. A "Hot-Rail" prevents ice and frost from forming on the door tract.



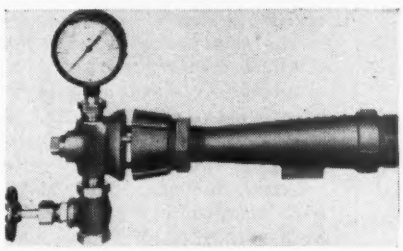
Stainless steel frozen food cabinet with glass rolling doors and display mirror.



Horizontal mixer that blends a wide range of materials.

Gas Mixers 7

PRODUCTION of a venturi mixer for high pressure gases, incorporating greatly improved mechanical design features, is announced by the Industrial Division, Bryant Heater Co., Dept. I, Cleveland, Ohio. Known as the "Hijector," the new unit uses gas under pressure up to 35 lb. to entrain all the air needed for combustion, and to deliver the mixture to burners at the highest possible pressure. By reversing the usual operation of the air shutter and locating it on the body, the orifice spud is accessible for removal without disconnecting any piping. Air entrainment noise is reduced, while the orifice and air entrainment areas are readily accessible for inspection or cleaning. The shutter, though backed entirely out of the way, cannot be disassociated from the mixer and become lost. Available in pipe sizes from ¾ to 4 in., it is suitable for use with all types of gases, including liquefied petroleum types.



Venturi high-pressure gas mixer.

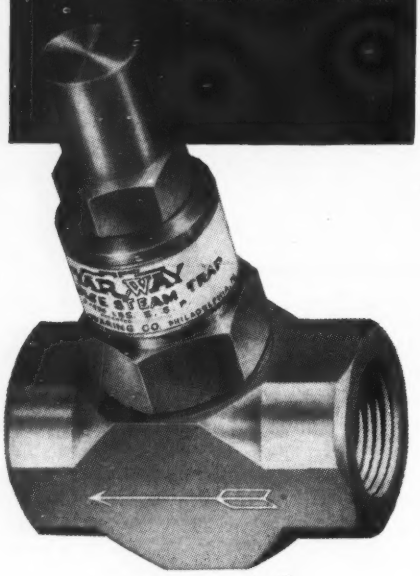
Horizontal Mixers 8

SEVERAL types of single and multiple arm horizontal mixers, suitable for mixing and processing a wide range of materials from dry powders to heavy viscous slurries and pastes have been introduced by the H. W. North Co., Dept. I, Erie, Pa. These improved machines are custom engineered for each individual application for batch, automatic or continuous operation. They are available in plain or stainless steel construction with mixing chambers jacketed when required for heating or cooling. Special designs for processing materials under vacuum or internal pressure have also been developed to meet such service conditions.

Cleaning Units 9

A PORTABLE cleaning unit that delivers a jet of hot or cold water at pressures from 300 to 500 lb., and does away with tedious hand work is made by the Special Machinery Div., A. B. Farquhar Co., Dept. I, York, Pa. The unit consists of a 3-cylinder, single action, reciprocating pump on a steel base approximately 2 ft. x 4 ft. 6 in. Base is mounted on 2 hard rubber tired wheels at the rear, and a ball-bearing caster in the front. The unit is made in

Good for
ALL
PRESSURES
without change
of Valve or Seat



- Quicker Heating
- Small Size
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- One Moving Part
- Low Price

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500,000
SOLD

Sold by more than 100 Mill Supply Distributors throughout the U. S. A. See your supply house or write for Catalog T-1739.

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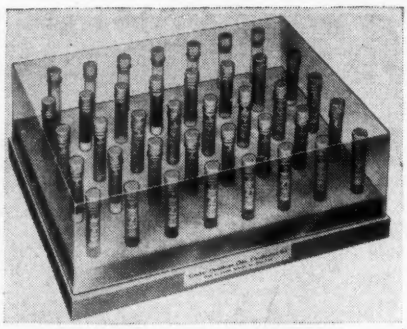
IMPULSE
STEAM TRAP



Odor standards in plastic covered block.

two sizes, 10 g.p.m. and 20 g.p.m., driven by 5 and 7½ hp., 3 phase, 220 volts, 60 cycle motors, respectively. Standard equipment includes 25 ft. of high pressure hose, couplings and one gun. The 20 gal. unit will operate two guns.

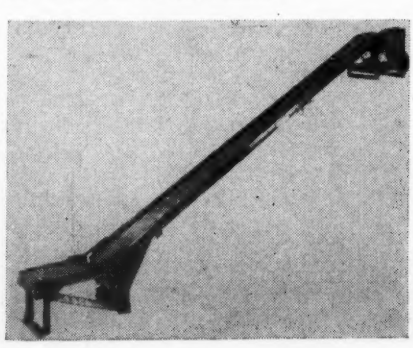
Odor Standards 10

FOR the control of odors of raw materials and finished products in foods, beverages, cosmetics and pharmaceuticals, a system of classifying odors according to the intensities of four components, which have been termed fragrant, acid, burnt and caprylic (goat-like) has been developed.

The several thousand combinations of these components make it possible to assign a specific number to any odor. There are definite ranges of odor numbers for such characteristic odors as fishy, rancid, fetid, tarry, oriental, flowery. The 32 standards, with extra empty vials, are furnished in a convenient wooden block with a transparent plastic cover. The Crocker-Henderson standards, as they are called, are sold by Cargille Scientific Inc., Dept. I, 118 Liberty St., New York 6, N. Y.

Elevating Conveyor 11

A BELT conveyor for elevating and lowering commodities, called "Incline Belt," is produced by the Standard Conveyor Co., Dept. I, North St. Paul 9, Minn. Set permanently at 28 deg. it is supplied with a rough surfaced belt, available in two widths and in lengths for floor to floor elevations of 8 to 14½ ft. The top end is curved to provide horizontal feed or discharge of commodities. It can be furnished with or without horizontal feed section at the bottom.



Inclined belt with horizontal feed section.

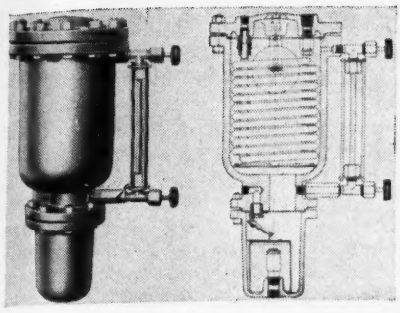
Lift Truck 12

THE AUTOMATIC SKY LIFT, a new telescopic, tilting, hydraulic lift electric fork truck is announced by Automatic Transportation Co., Dept. I, 149 W. 87th St., Chicago 20, Ill. It features the highest lift ever achieved on a fork truck of standard 83-in. collapsible height and, at the same time, is capable of tiering to ceiling heights in boxcars and low-clearance buildings. It has a pneumatic controller which operates as the electric counterpart of an automobile gear shift. When the accelerator is depressed, the controller starts the truck in first speed and automatically passes through the faster speeds. Controls include only two foot pedals, steering wheel and two levers. Brake pedal and foot accelerator are both identical to those of a car. The two levers—one controlling both tilt and lift, and the other forward-reverse direction—are just below the steering wheel.

Sky Lift Truck has pneumatic controller.

Work Glove 13

A NEOPRENE-COATED work glove which is oilproof and waterproof and yet extremely pliable is made by Riegel Textile Corp., Dept. I, 342 Madison Ave., New York 17, N. Y. Laboratory tests show the Neoprene coating to be strongly resistant to prolonged immersion in kerosene, petroleum, boiling water and other normally harmful industrial solutions. Dry heat and accelerated oxidation and weathering tests also failed to injure the new-type coating. The gloves have a knit wrist and are lined with soft flannel for increased working comfort. They are in use in vegetable packing, commercial fishing, brewing and other fields.



Armstrong refrigerating system purger.

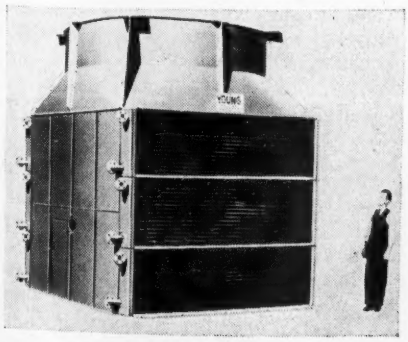
Gas Purger 14

A NON-CONDENSABLE gas purger for refrigerating systems, which in service tests has operated at efficiencies ranging from 98 to 100 percent, has recently been introduced by Armstrong Machine Works, Dept. I, 866 Maple St., Three Rivers, Mich. Design is essentially the same as in older Armstrong models except that the refrigerating jacket has been replaced by an internal coil. The purger also incorporates a non-condensable gas discharge mechanism in which the ball float used to actuate the valve has been enlarged and the valve itself improved. It is offered in two styles: No. 270 with semi-steel body for pressures up to 200 psi., and No. 370, with forged steel body for pressures up to 300 psi.

Water Cooling Units 15

FAN operated water cooling units in capacities ranging upward from 3,600,000 B. t. u. per hr. are available in the new VAD line announced by Young Radiator Co., Dept. I, Racine, Wis. These units are also suitable for oil cooling, steam and vapor condensing, and gas cooling, as well as combination arrangements to handle two or more types of service. They consist of a plenum chamber on two opposite sides of which are the extended-surface water cooling coils, and above which is the induced draft fan discharging vertically upward through a short stack.

Since the cooling faces are located on opposite sides of the unit, line installation of several units can be employed without loss of efficiency by blanking off the cooling faces. The design is said to give even air distribution and eliminate recirculation and



Induced draft cooling and condensing unit.

A Better STRAINER

- Cadmium Plated For Protection Against Corrosion and For Better Appearance
- High-Grade Woven Monel Wire Screen
- Readily Removed Steel Blow-Off Bushing
- Screen and Bushing Come Out Together—Go Back Together, Automatically Aligning
- For Steam Lines or Water, Oil and Other Fluids
- Reasonably Priced
- 6 Sizes from ½" to 2" for Pressures up to 600 lbs
- Many Thousands in Service
- Sold by Over 100 Mill Supply Houses

See Your Supply House or Send for Bulletin S-201

YARNALL-WARING COMPANY
127 Mermaid Avenue PHILADELPHIA 18, PA.

YARWAY STRAINERS

faster cleaning

For

STAINLESS STEEL EQUIPMENT

If quick cleaning is one of the factors that determines your use of stainless steel processing equipment, remember this:

A STAINLESS STEEL VESSEL WITH ROUND CORNERS CLEANS FASTER—MORE THOROUGHLY—THAN ONE WITH *SQUARE* CORNERS. Whether you clean with brush or cloth—you can "get at" all the surfaces of a round-cornered vessel easily. There are no corners in which residue can hide.

Having worked exclusively with stainless steel and alloys for many years, we have developed to a high degree the techniques needed to fabricate processing equipment with round corners.

Using tools and dies of our own design, we build your vessels so that cleaning time in your plant is cut to a minimum. Result: your stainless steel equipment costs less to operate and lasts longer. Consult with us.

S. BLICKMAN, Inc., 4103 GREGORY AVE., WEEHAWKEN, N. J.

S. BLICKMAN, INC.
Guards Alloys in Fabrication

SEND FOR THIS VALUABLE BOOK

A request on your letterhead will bring our guide, "What to Look For When You Specify Stainless Steel for Your Processing Equipment."

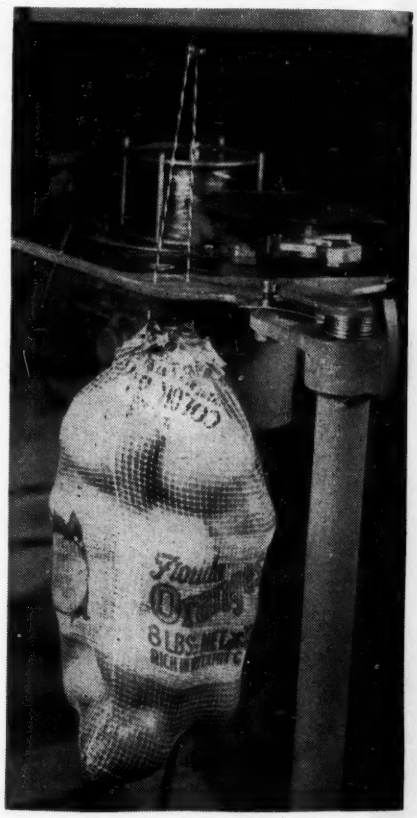
CORROSION RESISTANT PROCESSING EQUIPMENT

TANKS • KETTLES • STILLS • HEAT EXCHANGERS • AGITATORS • MIXERS • TOWERS • PIPING

cross-wind effects. A low fan speed is employed with minimum power consumption. Vertical mounting of the coils is said to insure easy maintenance and maximum protection from the elements. The end plates on the water coils are removable for quick and easy access to the tube header. The fan and drive assembly are mounted independent of the main unit assembly, thereby eliminating transmission of any vibrations from moving to non-moving parts.

Closing Mesh Bags 16

BEMIS BROS. BAG CO., Dept. I, 408 Pine St., St. Louis 2, Mo., in conjunction with the Bostitch Co., has developed a stitcher which greatly speeds the closing of filled open-mesh bags



Filled bags closed by new stitcher.

of citrus. Carried suspended by their drawcords from a conveyor after they leave the filling tables, the bags pass by a stitching machine which automatically staples the drawcord securely. The bags then pass on continuously to railroad cars or other transportation facilities.

Steel-Strapping Tool 17

A FASTER, lighter weight, streamlined combination steel-strapping tool has recently been made available by Acme Steel Co., Dept. I, 2840 Archer Ave., Chicago 8, Ill. Its weight is 6¾ lb. and it can be operated on a flat surface of just 5 inches. The tool has two levers, one for tensioning, another seals and cuts the strap. The counter action of the levers produces

John V. Ziemba (left), of Food Industries, and Ross A. Bennett, of Wright's Automatic Machinery Company, discuss recent trends in packaging. Food Industries' editors and field reporters confer frequently with Wright's and other manufacturers in search of advance information on new developments in packaging equipment.

Yes, Mr. Ziemba,

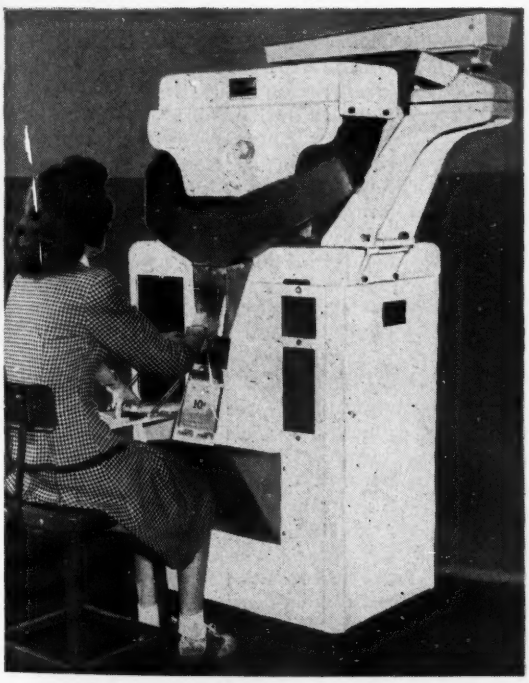
Packaging Editor of Food Industries

There is a new development in packaging equipment of interest to your readers.

IT'S HY-TRA-LEC

Hy-Tra-Lec is a new method of automatic weighing at pre-determined net weights. Based on the principle of positive displacement. No spring or beam scales. No fulcrum point. Provides a degree of accuracy at high speeds previously believed unattainable with a single weighing unit. Weights are determined in advance by adjusting controls on the machine which has a minimum number of parts and which operates smoothly and quietly

Dry Product Packagers, Please Note



Hy-Tra-Lec is new. The first commercial installation began operation last year. Forty leading manufacturers have replaced their previous hand or machine methods of weighing with Hy-Tra-Lec . . . and the list is growing every month. From potato chips to beans . . . if you package a dry product and desire accurate, high speed weighing, get the facts now on what Hy-Tra-Lec can do for you.

WRIGHT'S *Automatic Machinery Company*

SALES-SERVICE OFFICES:

31-10 Thomson Ave. Long Island City 1, N.Y. | **2400 West Madison St. Chicago 12, Ill.**

Calvin & Holloway Sts. Durham, North Carolina

MAIL THIS COUPON TODAY FOR FREE TEST DATA

Wright's Automatic Machinery Co.
Calvin & Holloway Streets
Durham, North Carolina

Gentlemen:

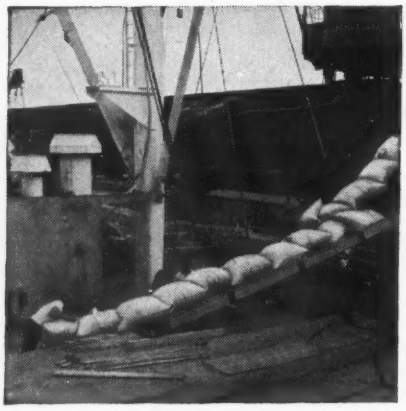
I accept your invitation to send me literature and FREE test data on your new Hy-Tra-Lec Automatic Weigher.

Name _____ Position _____

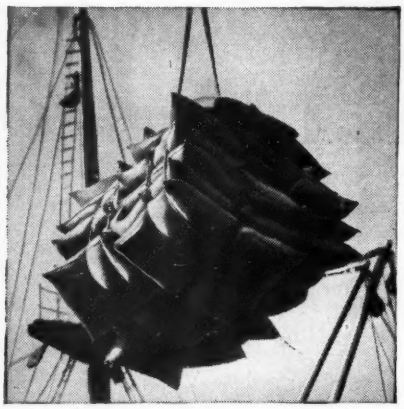
Company Name _____

Company Address _____

COFFEE'S "DEW-POINT DANGER HOURS" *Are Over Now!*



This #1 coffee, being loaded at Santos, is extremely vulnerable to dampness in shipping. Today Cargocaire controls dampness.



The same #1 coffee, being unloaded in New York—with no soft, pithy beans; no mold; no loss of flavor, aroma and body

New Science Prevents Damage from Dampness

Did you ever notice how dew condenses on a glass of cold water in hot, humid weather? This happens because the temperature of the glass is lower than the dew point of the air—that point at which moisture forms.

Any hour in any voyage, the same thing can take place on a far vaster scale in the holds of cargo ships.

For many cargoes, this means the "danger hour." Sweat forms in the hold. Dampness starts its costly damage on cargoes.

But now dampness can be controlled—surely, economically and easily, thanks to Cargocaire, the modern method of dehumidification and ventilation.

Cargocaire assures good cargo out-turn

Cargocaire operates when the moisture content of the air approaches the danger dew point . . . whenever a damaging weather-front is crossed. It acts also as a ventilating system.

The value of Cargocaire protection for most semi-perishable imports is attested by the preferential cargo insurance benefit provided by far-seeing underwriters.

Cargocaire is already standard equipment on more than 100 vessels of the world's major shipping lines. And 100 more ships may join the Cargocaire Fleet this year.

If you want your cargo protected against damage from dampness, phone or write for the services of the Cargocaire Technical Advisor. No obligation, of course.

If you import or export these commodities . . . coffee, cocoa, grains, canned goods, sugar, flax, seeds, oils . . . then learn how Cargocaire protects you. All are subject to the "dew-point danger hours" and damage from dampness.

Cargocaire

ENGINEERING CORPORATION

New York • Washington • San Francisco • Seattle
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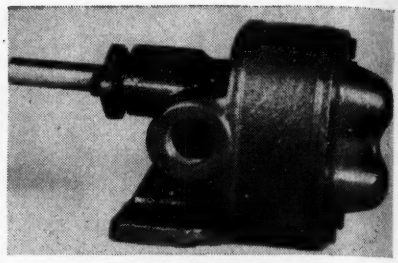


Small capacity general service pumps.

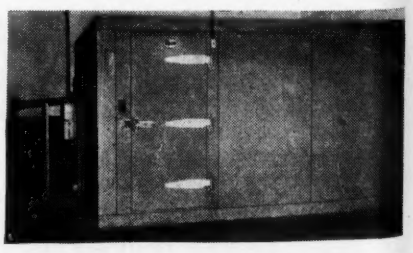
a balance on the strapping surface. Seals are automatically fed from a magazine which holds a clip of 100 seals. Fast and unlimited tensioning is provided by a front rotary stretcher dog and a positive lift of the rear gripping dog. A safety latch automatically aligns the strap. A strap retainer retains the cut off end of the steel-strap and holds it conveniently available for the next threading operation. It is made to handle ¼ in., ⅜ in., ½ in. by 0.010 to 0.020 in. sizes inclusive, both flat and tight edge straps. All wearing parts can quickly and easily be replaced on the job by the operator.

Rotary Pumps 18

A NEW line of general service rotary pumps, the GA Rotary type, has been introduced by Worthington Pump & Machinery Corp., Dept. I, Harrison, N. J. The pumps have been designed for durability under severest service requirements and are available in six sizes and various mountings for capacities up to 51 g.p.m. and 100 psi. Design features include four bearing construction and special herringbone rotors. Built-in pressure lubrication eliminates all external lubrication and the danger of liquid contamination. Models are available footmounted or flange mounted with adjustable stuffing box and mechanical seal. They are also available with or without oversize unloader type relief valve. All models are suitable for direct coupling to electric motors of any make.

Prefabricated Cooler 19

A LINE of prefabricated, low or medium temperature walk-in coolers is manufactured by Refrigeration Engineering Corp., Dept. I, 1518 Walnut St., Philadelphia 2, Pa. The coolers are insulated with 6 in. of fibre glass, and are so engineered that they can be moved or enlarged at any time with a minimum of effort and expense. The standard door panel may be placed anywhere around the box,



Prefabricated, sectional walk-in cooler.

It's a cinch!

Deciding which one of these Spencer Farms preserves to choose isn't much of a problem for this youngster. He knows that any way you figure it he's in for a treat. ◆ No more difficult was the selection of the Crown VPO Cap as the closure for these products. VPO Caps utilize the "top sealing" principle. Small lugs in the rim of the cap exert a vise-like grip, while the patented Slip Rubber Ring which is vulcanized to the inside of the cap creates a perfect hermetic seal. The back of a can opener blade is a handy pry-off cap remover, and just pressing the cap on makes a tight reseal.

Crown Cork & Seal Co., Baltimore, 3, Md.

World's Largest Makers of Metal Closures.

These Spencer Farms products are packed by the Palmer Fruit Products Co., Long Island City, New York.

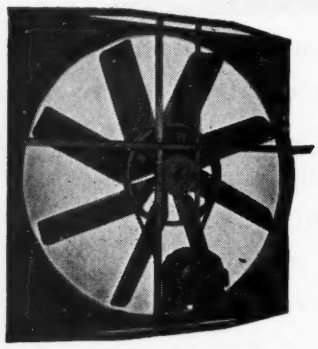
CROWN CLOSURES

Employees are More Productive

WITH

Coolair
TRADE MARK

EXHAUST FANS



SUCCESSFUL MANAGERS have discovered that vitalizing *fresh air,* steadily moving through offices and work rooms, is an important factor in developing maximum worker efficiency. It may be that YOUR plant, like many others, is merely in need of better ventilation to bring present employees to the very peak of their efficiency.

COOLAIR EXHAUST FANS, similar to the illustration, are now available in 16 sizes, with certified air delivery capacities ranging from 6,200 to 48,000 cubic feet per minute! This amazing size flexibility provides the means of scientific ventilation in all types of applications.

YOUR COOLAIR DEALER, or agent, will be glad to make a survey of your building without obligation to you. Call him in today, or write.

ENGINEERS and ARCHITECTS
For descriptive and technical data see:
SWEET'S CATALOG FILE Architectural
SWEET'S CATALOG FILE for Builders
A. S. H. V. E. GUIDE
ELECTRICAL BUYERS REFERENCE

AMERICAN COOLAIR CORPORATION
Pioneer Manufacturers of V-Belt Drive Exhaust Fans
3604 Mayflower Street **Jacksonville 2, Florida**

SODIUM BENZOATE U. S. P.

Flake ***Powdered***

Free-flowing, readily soluble

Produced by

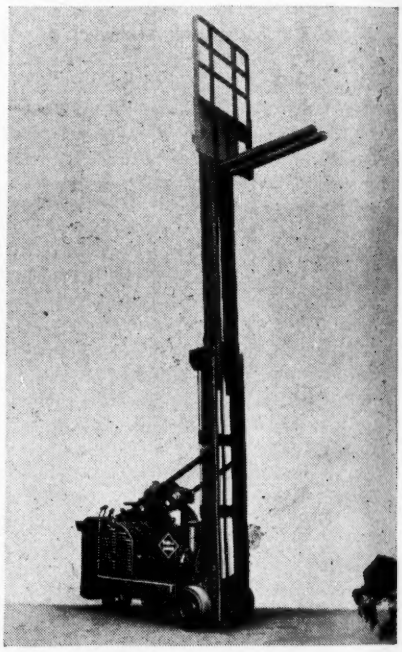
TENNESSEE PRODUCTS CORP.

GENERAL OFFICES: NASHVILLE, TENN.
EASTERN SALES OFFICE: 350 FIFTH AVE., NEW YORK, N. Y.

opening either to the left or to the right, and insulated partitions can be furnished to divide the cooler into two or more compartments. Extra door panels for each such compartment can be provided. Coolers come in four sizes, the largest of which is 12 ft. 10 in. wide by 7 ft. 6 in. high by 32 ft. long.

High Lift Fork Truck 20

WITH an elevating reach 18 ft. above floor level, a fork type power industrial truck, suitable for high-tiering materials and merchandise, has been announced by Elwell-Parker Electric Co., Dept. I, 4205 St. Clair Ave., Cleveland 14, Ohio. Its capacity is rated at 4,000 lb. for lifting to a height of 11 ft. and 3,000 lb. to 18 ft.



Fork truck with 18 ft. lift

Equipped with three separate motors; one for traveling, one for operating the elevating mechanism, and the third for tilting the upright columns, it has a lifting speed of 13 ft. per min., lowering speed of 20 ft. per min., and traveling speed of 5 m.p.h. Body of truck is independent of uprights and forks, is 7 ft. 8 in. long by 3 ft. 2 in. wide.

Steam Cleaning Unit 21

AN improved steam cleaning unit that has cut cleaning time in canning and packing plants has been announced by Oakite Products, Inc., Dept. I, 126G Thames St., New York 6, N. Y. It is an enclosed coil type, down-draft steam generator that delivers a hot vaporized spray in either wet or dry state under pressure sufficient to operate two steam guns simultaneously. 12-gal. capacity of fuel tank provides ample generation for an 8-hr. 2-gun cycle. The model incorporates simplified grouping of gages and controls; redesigned piping and

All piping equipment for every need ...on one order to CRANE

Yes, sir!... one order gets you everything for the job... good, dependable material down to the last item. But that's just one way the truly complete Crane line helps to simplify all your piping jobs.

For example, take this **heat reclaim system.** At every step of the installation—from design to erection to maintenance—standardizing on Crane equipment pays big dividends. They're assured by this 3-way advantage—

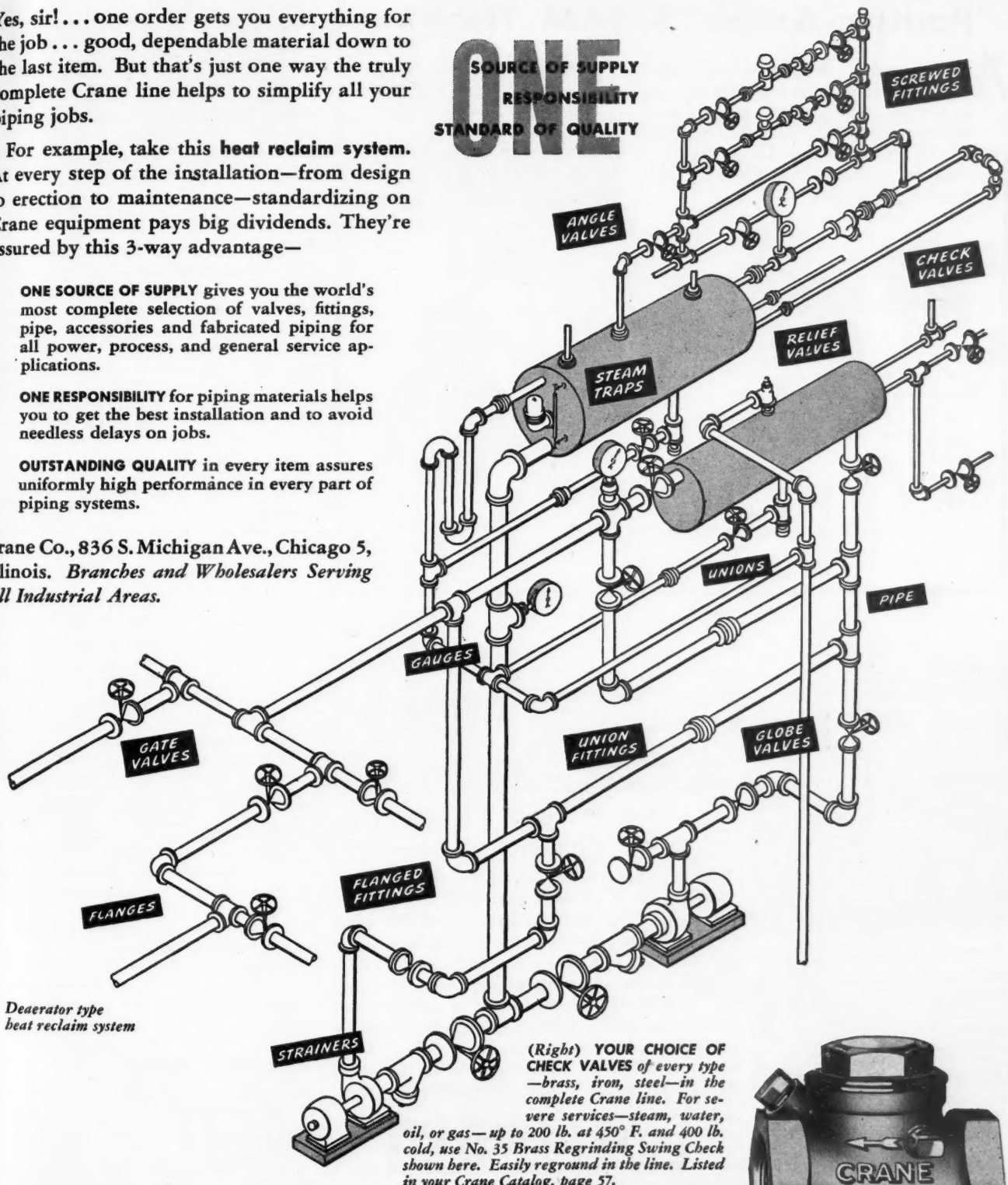
ONE SOURCE OF SUPPLY gives you the world's most complete selection of valves, fittings, pipe, accessories and fabricated piping for all power, process, and general service applications.

ONE RESPONSIBILITY for piping materials helps you to get the best installation and to avoid needless delays on jobs.

OUTSTANDING QUALITY in every item assures uniformly high performance in every part of piping systems.

Crane Co., 836 S. Michigan Ave., Chicago 5, Illinois. *Branches and Wholesalers Serving All Industrial Areas.*

ONE
SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



Deaerator type heat reclaim system

(*Right*) **YOUR CHOICE OF CHECK VALVES** *of every type—brass, iron, steel—in the complete Crane line. For severe services—steam, water, oil, or gas—up to 200 lb. at 450° F. and 400 lb. cold, use No. 35 Brass Regrinding Swing Check shown here. Easily reground in the line. Listed in your Crane Catalog, page 57.*

EVERYTHING FROM ...

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

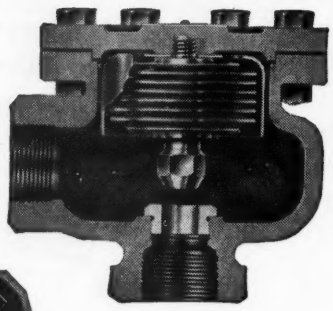
FOR EVERY PIPING SYSTEM

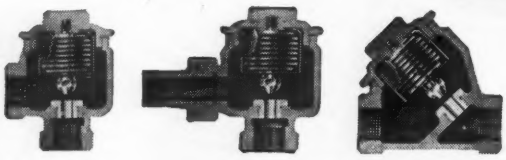
Tighten Your Quality Controls

with NICHOLSON

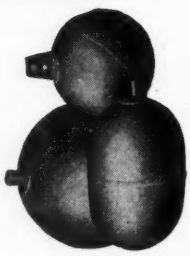
'Positive-Action' STEAM TRAPS

Featuring 2 to 6 times average drainage capacity, as well as freedom from air-binding, freeze-ups and water-logging, Nicholson steam traps afford a positive fast action that increasingly recommends them for removing process variables.





Nicholson thermostatic steam traps are furnished in 5 types for any processing, power or heat application. Sizes 1/4" to 2"; pressures to 225 lbs. Details and piping plans in Catalog 444, or see Food Industries Catalog.

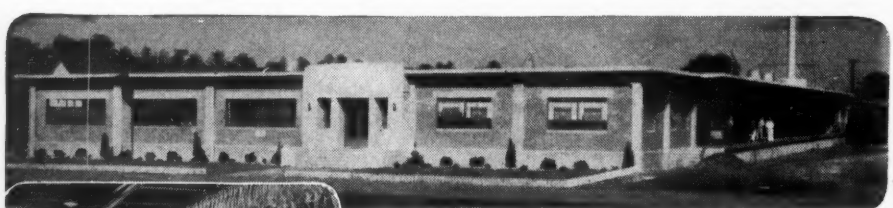


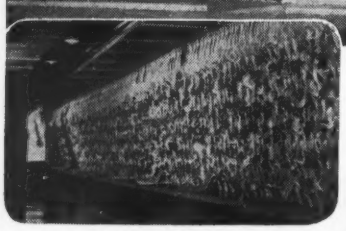
One of America's largest makers of welded floats for processing purposes. All sizes and shapes. Send for Bulletin 746.

W. H. NICHOLSON & CO.

193 OREGON ST., WILKES-BARRE, PA.

Valves • Traps • Steam Specialities





Processed Chickens in 35° Room

Frick-Freezer Held at –40°F.

Zero Storage and Refrig. Machines

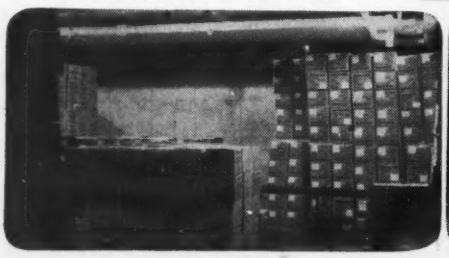
How to Quick-Freeze 6000 Chickens a Day—

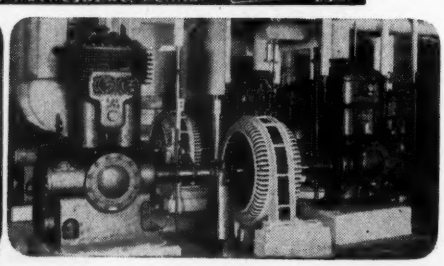
Birds Eye-Snider Division, General Foods Corporation, do it at their new $800,000 plant in Pocomoke City, Md., by keeping 45,000 birds on hand, using conveyor processing lines totaling 1500 ft., precooling the chickens to 35°F., quick-freezing at temperatures down to minus 40°, and storing at zero. • Frick refrigeration carries the entire cooling load. Installation by Mollenberg-Betz Machine Co., Frick Sales-Representatives at Buffalo. • Let us quote on that Frick-Freezer YOUR community needs.

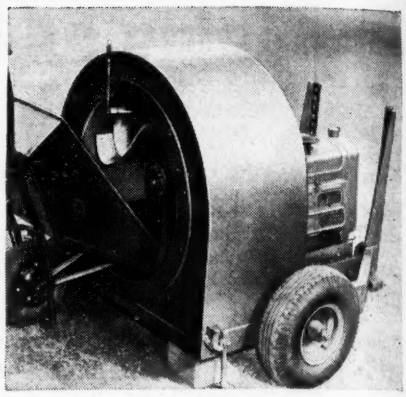
DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.







Three cu. ft. portable mixer.

a compressed air valve assembly for 2-min. anti-freezing of the entire water-steam system. Cleaning solution is aspirated through the gun from a separate tank, by-passing the steam coils. The unit is available as a stationary model; mounted on shop-wheel chassis; or mounted on a trailer for use away from the plant. A ¾ hp. a.c. motor is mounted on the unit.

Portable Mixer

THE FOOTE KINETIC MIXER, a portable 3 cu. ft. machine, designed to handle asphaltic mixes, sand, feeds, foods, ceramics, chemicals, floor emulsions, insulating materials, roofing materials, paints and concrete has been announced by The Foote Co. Inc., Dept. I, Nunda, N. Y. Capacity is as high as two batches per min., depending upon conditions and the materials being mixed. The operating cycle at this speed is 5 sec. for charging from a wheelbarrow, 20 sec. for mixing, and 5 sec. for discharging by a hand-controlled chute at the top of the machine. The mixing action is accomplished by a revolving drum and three stationary blades. Liquid is introduced by a pump that is controlled by an automatic timer which closes the hand-operated control valve when the desired gallonage has been introduced.

The mixer is powered by a 12 hp. gasoline engine, or can be equipped with an electric motor. Approximate weight is 1500 lb. It is mounted on pneumatic tires. An adjustable truck hitch is provided for transporting.

Vacuum Gage

AN economical signal for high vacuum production lines is announced by Distillation Products, Inc., Dept. I, 755 Ridge Road West, Rochester 13, N. Y. Known as the "Skanascope," the gage indicates through color on a fluorescent screen, instead of by means of needle and scale, the total number of molecules per unit volume in the vacuum system, including all residual gases and vapors, regardless of their condensability.

It is designed to operate continuously, and as a result it is possible to read the operative status of the

Artist – Boardman Robinson, native of Colorado

COLORADO—*annual purchases: $720 million—mostly packaged.*

CONTAINER CORPORATION OF AMERICA

Save Waste Paper

Economy in packaging

. . . calls for protection against loss by leakage, or contamination by outside contacts.

INLAND STEEL CONTAINERS

. . . have the strength and tightness for safely packaging the thinnest liquids or penetrating products. Losses and product contamination are eliminated.

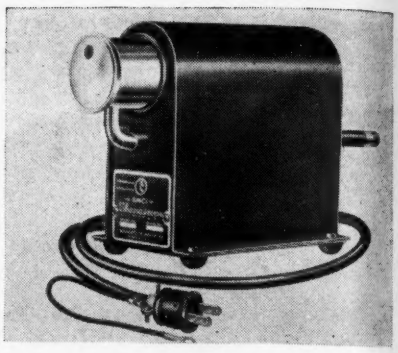
Steel drums and pails capacities 3 gal. to 55 gal.

INLAND STEEL CONTAINER CO.

Container Specialists

6532 S. MENARD AVENUE., CHICAGO 38, ILLINOIS

Plants at: Chicago • Jersey City • New Orleans



"Stop" and "Go" gage for high vacuum.

vacuum system by a glance at the color screen at any time. It monitors the total pressure of permanent and condensable gases and compensates for the effect of temperature changes on the pressure. It connects directly to the vacuum system, and needs no calibration or zero setting. It may be permanently plugged into a standard electrical receptacle, since no current will flow until the system is under vacuum. The instrument is 8 in. high, 4½ in. wide, 12 in. long and weighs 7½ lb.

Staling Retarder 24

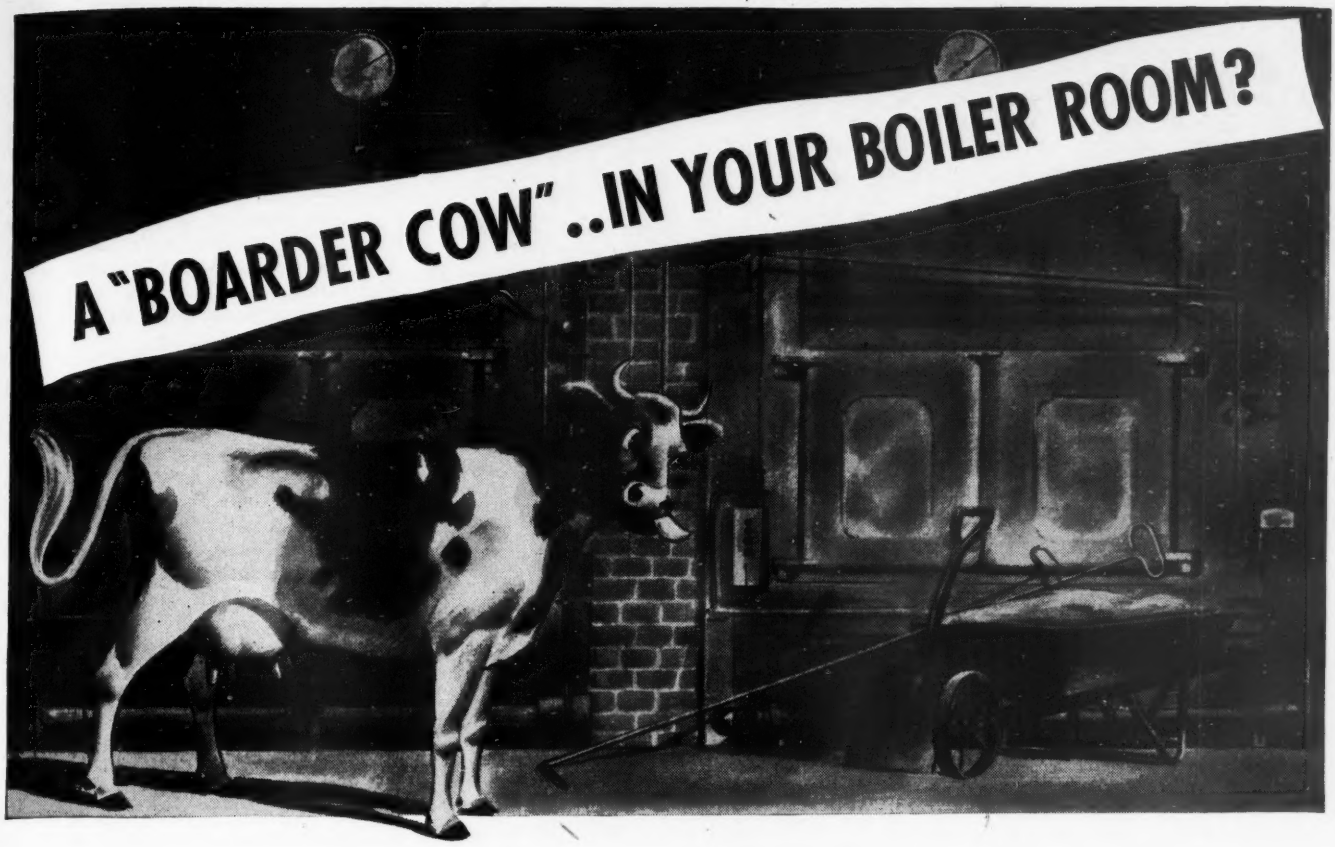
MERJ 45 is the name of a new crumb-softener and staling-retarder, which will make yeast-raised bread, rolls and sweet goods soft, and keep them soft longer. It is added to the mixer at the same time shortening and milk are added. Its action takes place during the normal baking process and no special precautions are necessary in its use. MERJ 45 is produced by the R. T. Vanderbilt Co. Inc., Dept. I, 230 Park Ave., New York 17, N. Y.

Non-Toxic Roach Killer 25

FAIRFIELD LABORATORIES, INC., Dept. I, Plainfield, N. J., has introduced an exterminating powder that is harmless to humans and other warm-blooded animals. It possesses amazing toxic affinity for cold-blooded insects, including roaches, silver fish, ants, waterbugs and centipedes. Any contact with the powder quickly induces paralysis, resulting in death to the insect. No special equipment or personnel training in extermination is necessary. Anyone using an inexpensive dust gun can blow it into cracks, walls, cabinets and other suspected roach refuges to flush the insects into the open where they die. The powder is stable and has long lasting residual properties.

Printing Presses 26

A NEW line of multi-color rotogravure and rotary letter presses for the package, label and wrapper printing trades is announced by the Sperry Corporation, Dept. I, Long Island City, N. Y. Designed to the specifications laid down by leading printers the new line is expected to fill the need



If you are familiar with dairy farming you know the significance of the expression "boarder cow" — the "critter" that feeds prodigiously but yields only a bare minimum of milk.

Some steam boilers are like boarder cows — eating enormous amounts of fuel for minimum yields of steam.

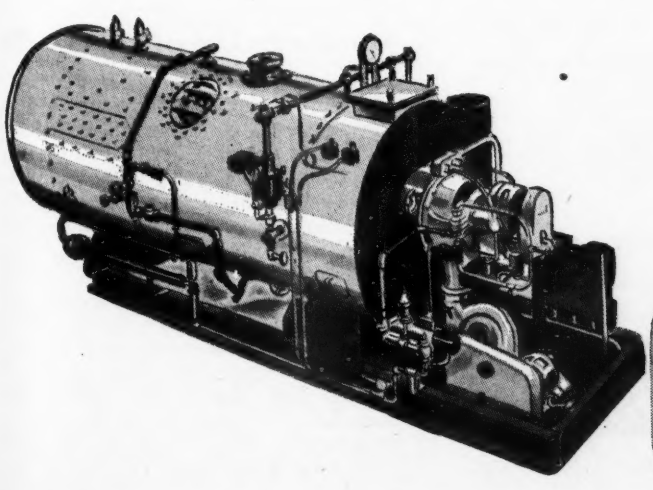
Check your operating budget to realize the money-loss involved in faulty steam generating. It's a needless loss, too, for steam generating costs can be substantially cut — service vastly improved.

A custom-planned, application-engineered Cleaver-Brooks Steam Generator installation has made lower fuel and steam costs a reality in scores of plants. Here are some of the reasons:

- A steam plant tailored for your job. Cleaver-Brooks analyzes your load conditions, space and equipment arrangements, future growth needs, puts unit into initial operation, instructs as to operation, care, maintenance.
- Designed for utmost convenience of operator—all controls may be operated from front of boiler. A factory engineer puts unit into initial operation, and trains your employees in operation, care, maintenance.
- One source and one responsibility for the complete generator—Cleaver-Brooks factory-finished and tested—a fully "packaged" unit meeting all code requirements.
- Fast installation. No special foundation needed. Within 24 hours after arrival, your Cleaver-Brooks Steam Generator can be in operation.
- No smoke-stack required; simple roof-high vent exhausts combustion gases.
- Saves space, uses less plant area, fits into low head-room locations.
- Oil-firing eliminates smoke, ashes, clinkers, messy boiler-room conditions.
- Low operating costs; unsurpassed guarantee:—80% thermal efficiency from full load down to 30% of its rating; 13% CO_2 gases; stack temperature not to exceed 125° F. above standard steam temperature.
- Quick steaming—for any emergency or fluctuating loads—through high heat transfer with Cleaver-Brooks 4-pass down-draft construction and integral oil-burner.
- Full-size range is available—22 models in sizes from 15 to 500 h.p., at steam pressures from 15 to 200 lbs. p.s.i. Write for bulletin and complete information.

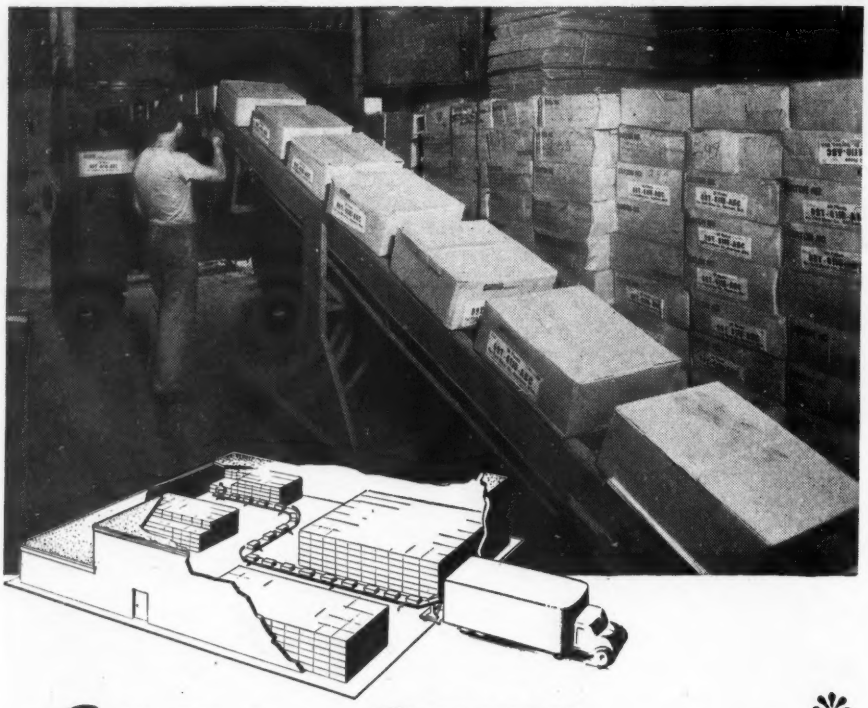
CLEAVER-BROOKS COMPANY

327 E. KEEFE AVENUE MILWAUKEE 12, WISCONSIN



Cleaver-Brooks
STEAM
GENERATORS

WRITE on your business letterhead for the Free Steam Cost-Calculator — a ready-reference slide rule showing the comparative steam costs when using oil or coal as fuel.



2 MEN load 9 TONS per hour*

*IN ONE YEAR THIS EQUALS

43,200,000 Pounds or 2 Heavy Cruisers

THE PROBLEM

Baker Cartage Company of Detroit hauls cartons of pistons for the Ford Motor Company. Cartons weigh approximately 50 pounds each and are stored in a large warehouse that does not have a loading dock. Cartons must be moved as much as 200 feet and then lifted into a truck.

SOLVED BY RAPIDS-STANDARD

Rapids-Standard engineers suggested Rapid-Wheel Gravity Conveyors with Q-Stands for carrying the cartons through the warehouse and a Rapid Power Booster for lifting them into the truck. The installation has been an outstanding success. Two men, one feeding the conveyor and one stacking inside the truck, handle an 800 carton load weighing 21 tons in 2⅓ hours. The complete operation can be handled by the driver and his helper.

The same set-up is used for unloading trucks. The direction of the Power Booster and the slope of the gravity conveyor are simply reversed.

The installation can also be operated with just one man. The conveyor is set up in the usual way and the man feeds the gravity conveyor until it is loaded with cartons for its full length. Then he climbs into the trucks, turns on the Rapid Power Booster and cartons are fed to him until the line is empty.

Rapids-Standard Portable Conveyors have a time and money saving place in the handling of cartons, bags, cases, bales, cans or packages. Write today for full information on how they will save for you.

OFFICES IN PRINCIPAL CITIES

Manufacturers of

STEEL FORGED CASTERS · TRUCKS · CONVEYORS · POWER BOOSTERS

The Rapids-Standard Co., Inc.

Sales Division—361 Peoples National Bank Bldg., Grand Rapids 2, Michigan

for rugged, high productivity presses to make multi-colored printing economically practical for many additional products. Special design attention has been given to the printing of foil, cellophane and other modern packaging materials. Of special interest to the box maker is the new rotary cutting and creasing unit which can be used in conjunction with the printer. This makes possible multi-color printing, cutting and creasing, and stripping at high speeds in a single straight-line operation.

Magnetic Screen Trap 27

FOR removing both magnetic and non-magnetic material from oils, gasoline, air and gas, the Cooney Valve and Screen Co., Dept. I, Erie, Pa., is producing a screen trap incorporating a special mesh screen and a powerful permanent magnet built into a single, compact unit. The body of the trap is made of brass, bronze or aluminum. The screen is without braces, stanchions or supports which offers a clear, unobstructed filtering area. It is a unit separable from the screw cap to facilitate cleaning, renewal or change of wire mesh. The combination when placed in a liquid, vapor, gas or air line, stops all abrasive material. Flow of material is maximum, with a minimum of pressure drop.

Mechanical Filter 28

A NEW "Pur-O-Cel" water filter for small water treatment plants, that makes filtering a simple, mechanical operation and requires no skilled operators is announced by Proportioneers, Inc., Dept. I, 30 Codding St., Providence 1, R. I. This filter utilizes thin mats of diatomaceous earth rather than a sand bed. It produces clear water and removes all amoebic dysentery cysts and many bacteria. Other models will soon be available to filter oils, juices, wines, chemical serums, cleaning fluids and liquid soaps. It is much smaller than a sand filter of the same capacity. Backwashing is easily accomplished without disassembling the unit and with a comparatively small volume of water.

Automatic Dehumidifier 29

CARGOCAIRE, is the name of an automatic humidifier that is being used to prevent sweat damage to ship cargoes. The unit provides ventilation with outside air alone, when its dewpoint is low enough and, when weather conditions demand, it supplies dehumidified air to mix with outside air. Duplicate and inter-connected absorber beds are installed in the unit. When one bed has become saturated with moisture, the other automatically starts to supply dehumidified air. The saturated bed is then reactivated with heat. Cargocaire is produced by Cargocaire Engineering Corp., Dept. I, 15 Park Row, New York 7, N. Y.

CATALOGS, BULLETINS

This digest of manufacturers' new publications is offered by FOOD INDUSTRIES Reader Service as a convenience for executives. The editors feature catalogs, data sheets and technical pamphlets likely to interest purchasing agents, superintendents, packaging men and food technologists.

Food Plant Equipment

Quick Freezing Equipment 51

Frick Co.—Bulletin No. 147-B. "Ice and Frost." An 8-page illustrated booklet describing the quick freezing of food products with very cold air produced by the Frick 2-stage Booster Refrigeration System. Describes, with many photographs and drawings, Unit Blizzard Freezers, Open Tunnel, Track Tunnel, Conveyor Tunnel and Special Freezers.

Jacketed Kettles 52

Lee Metal Products Co.— Bulletin LM-3 on Lee Corrosion-Resistant Super Jacketed Kettles with New York Type Tilting Agitators. Contains illustrations and descriptions of kettles made in stainless steel, pure nickel and monel metal to handle light and medium products where utmost sanitation and low count bacteria are required.

Enrober 53

National Equipment Co. — Working model demonstrator of the new National Enrober with extra sanitary features. Enables anyone to personally inspect all parts of this equipment without moving away from his desk. Schematic arrangement of enrober for typical plant setup is also shown.

Spray Nozzle 54

Link-Belt Co.—Folder 1632-10-37 describing the Link-Belt non-clogging spray nozzle for spraying, washing and cleaning all kinds of materials. Contains illustrations of various uses, lists applications and gives capacities.

Crate Machine 55

Saranac Machine Co.—Bulletin 167-U on Universal Jr. Crate Machine, for making a wide variety of crate styles and sizes. Contains illustrations and descriptions.

Automatic Speed Control 56

Hydraulic Automatic Control is the title of a bulletin recently released by Reeves Pulley Co. Contains photographs of typical installations, line drawings and descriptions of the operating principle of the Reeves Hydraulic Automatic tension and speed control.

Cast Iron Radiation 57

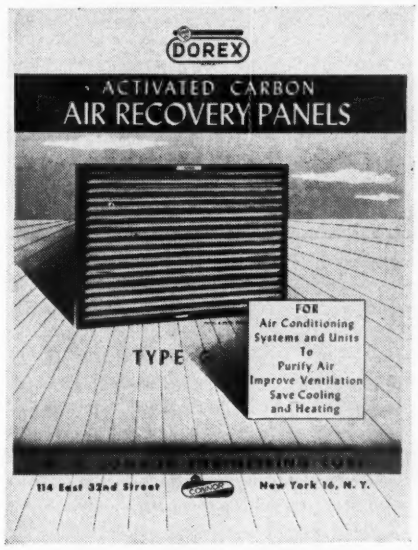
D. J. Murray Mfg. Co.—Bulletin CIR-345, Grid Fin Type Cast Iron Radiation. Contains illustrations and tables of dimensions and ratings for both radiators and convectors.

Industrial Locker and Washrooms..58

"I.S.R.F. Locker and Washroom" is the title of a 12-page brochure recently issued by the Industrial Sanitation Research Foundation. It describes locker and washrooms for industry, incorporating the latest developments in color dynamics, temperature control and air conditioning. It outlines numerous designs and features which should be included in remodeling and expansion programs. Profusely illustrated. Sanitation News Letter, Vol. II, No. 2, "Corrective Sanitation," and Vol. II, No. 3, "Preventive Sanitation." Both are well illustrated loose leaf pages for filing.

Air Conditioning 59

W. B. Connor Engineering Co.—Bulletin 106-A. 18-page booklet featuring the Type G Dorex activated carbon air recovery panels for air conditioning systems and units to purify air, improve ventilation, and to save cooling



and heating. This equipment is described in detail as to purpose, function, application, operation and service. Construction and dimension details are illustrated and performance data for the various types of equipment and sizes are tabulated. Several applications are described.

Oil Burners 60

York-Shipley, Inc.—6-page bulletin describing Steam-Pak generators and industrial burners. Contains illustrations and specifications.

Chocolate Decorator 61

Chocolate Spraying Company—4-page bulletin on Latini chocolate decorator for roughing and decorating machine coated chocolates. Contains illustrations and descriptive matter.

Coupling 62

Snyder Sales Corp.—Loose-leaf booklet illustrating and describing the All-Flex ball bearing swivel type coupling available from this company. Construction details are shown and specifications are included.

Gearshift Drives 63

The Lima Electric Motor Co.—6-page bulletin covering the Lima gearshift drive line. This bulletin reviews the application of these drives to all types of production equipment requiring selective speeds and illustrates the interior of the drive by means of a sectional view which shows many important features incorporated in the unit. It also illustrates the standard Lima electric motor line as well as the new Lima pedestal grinders, polishers and buffing lathes.

Evaporative Coolers 64

Buffalo Forge Co.—Bulletin 3230-C on evaporative coolers developed to meet the need for an efficient water cooler in the Diesel and natural gas engine field.

Small Regulating Valve 65

A. W. Cash Valve Corp.—Bulletin No. 199 describing Cash-Acme small volume pressure reducing and regulating valves for use on drinking fountains, water coolers, humidifiers, gas refrigerators and spray paint outfits.

Vegetable Oil Refining 66

The M. W. Kellogg Co.—10-page brochure entitled "Prescription for Glycerides" which illustrates and describes the Solexol process for refining of vegetable, animal and marine oils. Information is given on its use in processing and refining of tallow, soybean oil, sardine body oil, linseed and shark liver oils, and fatty acids, together with information on possible uses of the fractionated products. It includes an analysis of the economic advantages claimed for this new refining method.

Mixers 67

Mixers, Inc.—"Better Mixing Makes Products Better," a folder describing the Kutmixer for food products. Contains illustrations and descriptions of the twin screw mixer that rubs, kneads and agitates without splashing, the Triplex jacketed, temperature-control mixers and vacuum operated mixers.

Hydro Conveyors 68

Sinclair-Scott Co.—Folder on the new Hydro-Conveyor system that carries peas, beans, corn, diced vegetables, beets, olives, cherries, strawberries and other canning industry products 100 ft. straight up or for any horizontal distance.

Can Labeling 69

A new edition of "Successful Can Labeling," fully revised to include post-war technics and materials, has been issued by National Adhesives. The handbook covers operating practices

HOW TO GET THIS LITERATURE

Food Industries Reader Service now supplies tear-out coupon cards for your convenience in requesting copies of these new publications from manufacturers. Use one or more of the cards on the colored sheet bound opposite this page. Fill out, tear out, mail out and the Reader Service staff will see that your requests reach the manufacturers.

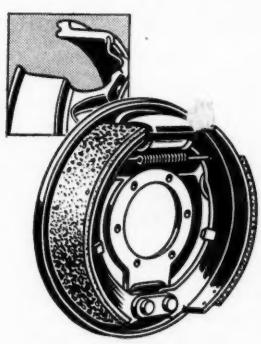
"THINK they last longer! Mister, I KNOW

FORD TRUCKS LAST LONGER!"

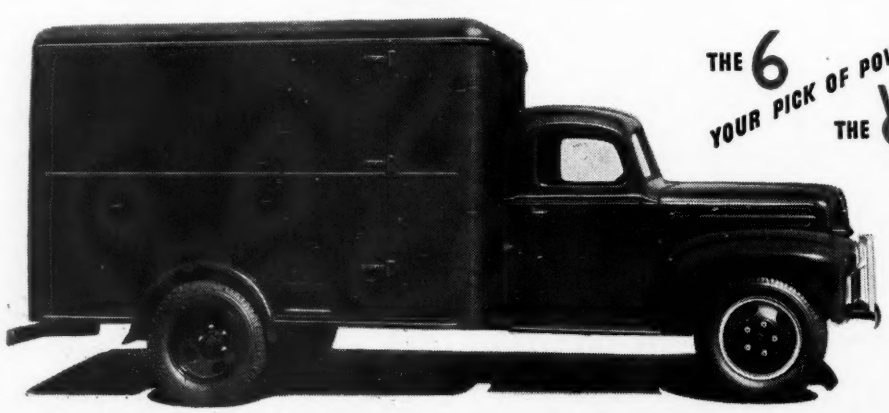
That's what Mr. R. G. Colvert of Ardmore, Oklahoma, wrote recently. "One of our Ford Trucks 11 years old," he added, "has gone over 250,000 miles and it's still on the job, with lots of good miles in it!"

ONE big reason—FORD BRAKES STAND UP!

The wide, heavy, cast drum surfaces of Ford Brakes are non-warping and score-resistant. They are interlocked and fused with steel drum discs during casting, providing great strength and reducing weight. The two shoes are independently anchored, each shoe being actuated by its own hydraulic piston. Adjustment is extremely simple and entirely external. Brakes are exceptionally stable in adjustment. Entry of water and dust is minimized by closely fitted tongue-and-groove design, where edges of drums meet backing plates. Ford brake design promotes long lining life, consistent performance, extra-safe stopping ability and easy pedal pressure.



Ford



For maximum load protection and easy maneuverability, the 158" Ford heavy duty chassis with standard Ford cab and a good closed van body is a national favorite. The Van shown is by Maday Body Works, Buffalo, N. Y.

ONLY FORD GIVES YOU *ALL* THESE LONG-LIFE FEATURES: Your pick of power—the great V-8 or the brilliant Ford Six—extra-strength frames, with siderails *doubled* in heavy duty models—new Flightlight, 4-ring, oil-saving pistons—full-floating and ¾-floating axles, with axle shafts free of weight-load . . . more than fifty such endurance-engineering features in all. It's because of this long-life construction that *of all trucks 14 years old or older on the road today, there are more Ford Trucks than all other makes combined!* More than 100 body-chassis combinations to choose from. Ask your Ford Dealer to show you!

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE!

for both spot and overlap labeling, by hand and by machine. It suggests the best methods for handling various types of label stock, and covers the choice of adhesives and care of machines. A detailed check-list section gives causes and correctives for common labeling difficulties such as staining, rusting, slipping, or crooked labeling, poor adhesion, wrinkling, failure to pick up labels, and tearing. A special section, "How to Determine Can Temperatures," will prove of particular value in selection of an adhesive for fast, efficient labeling.

Heat Exchangers **70**

The Sims Co.—14-page bulletin, HR-2, "Heat Recovery from Internal Combustion Engines." Contains photographs of many installations, sectional views, dimensions and performance tables of the several types of Sims heat exchangers. Also sectional views, line drawings, and dimensions of Sims exhaust gas boilers and 3-way swing valves.

Materials Handling

Conveying Equipment **71**

Bosworth Engineering Co. — Announcement on loading and conveying equipment designed and built by Bosworth. Illustrates and describes the Conveyall loader in three models powered with either electric motor or gasoline engine.

Lift Truck **72**

Lewis-Shepard Products Corp. — 8-page illustrated booklet describing the Power Jack Lift, a new electric lift truck made by this company. Important features are illustrated and described, and dimensions as well as capacities are given for the various models. Specifications for the different models are listed. Several applications are shown.

Pumps **73**

Byron Jackson Co.—Bulletin 46-5000, 12-page bulletin describing the outstanding characteristics, performance and applications of the firm's line of submersible motor-pump units that can be entirely submerged in water at any depth. Schematic drawings show principles of operation. Includes data on sizes and capacities of three basic types designed for general deep well applications, for low capacity and high head operation and for high capacity and low head operation.

Portable Conveyor **74**

May-Fran Engineering, Inc.—8-page bulletin on May-Fran Little Hustler portable, adjustable conveyors. Many application photographs. Line drawings of possible positions and specifications.

Control Equipment

Air Distribution Products **75**

Barber-Colman Co.—12-page pocket size booklet on automatic controls, air distribution products, small motors, containing many illustrations of controls, grilles and registers for residential and commercial heating, ventilating and air conditioning.

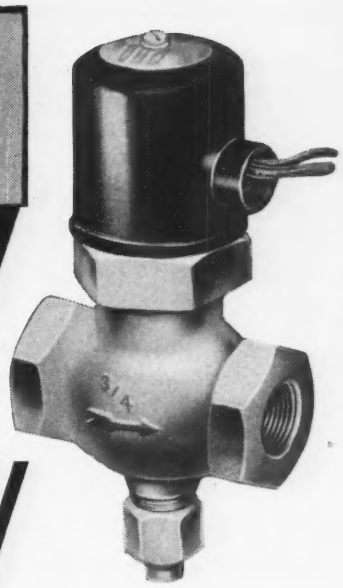
Level Indicators **76**

Fuller Co. — Bulletin 1-3, entitled "Fuller Material Level Indicator for Storage Bins and Silos," contains six pages which illustrate and describe this piece of equipment.

Recording Rotameter **77**

A new type of recording rotameter utilizing the Dynalog system of transmission by electronic high frequency circuits is described in SK Bulletin 18-R2 by Schutte & Koerting Co. With

New SINGLE SEATED VALVES



• Unsurpassed refrigeration valves, specifically designed for the control of Freon, Sulphur-dioxide, Methyl-chloride—suction lines or hi-pressure liquid lines. Also air, water, gas, light oil, etc.

• These direct operated, single seated needle valves are held open electrically, thus eliminating unnecessary compressor burdens. Positive shut-off for fractional tonnage installations.

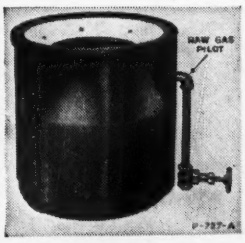
• Features: Die-forged bodies · Hardened steel needles · Corrosion-proof internal parts · Gasketless construction Integral mounting features · Moisture-proof construction · High pressures Single or dual voltage coils.

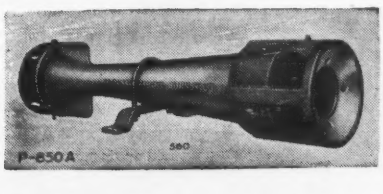
by K-15

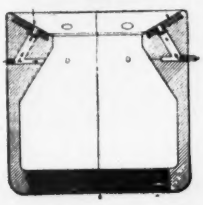
GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.
Manufacturers of Automatic Pressure, Temperature & Flow Controls
FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

NATIONAL AIROIL FUEL OIL - GAS BURNERS

"AIROCOOL" GAS BURNER NOZZLES
(PATENTED)
insure stable ignition over a long, trouble-free life







Recessed facing of refractory insulating plastic protects nozzle from extreme heat and prolongs nozzle life.

For detailed information about these long-life nozzles, write for Supplement 3 to Bulletin 55.

Renewable type recessed gas tips direct the separate igniter flames against the main volume of the mixture to insure stable ignition; prevent over-heating and burning of castings; and allow greater turndown without burnback.

NATIONAL AIROIL BURNER CO., INC.
Main Offices & Factory: 1272 EAST SEDGLEY AVENUE, PHILADELPHIA 34, PA.
Texas Office: 2nd National Bank Bldg., Houston

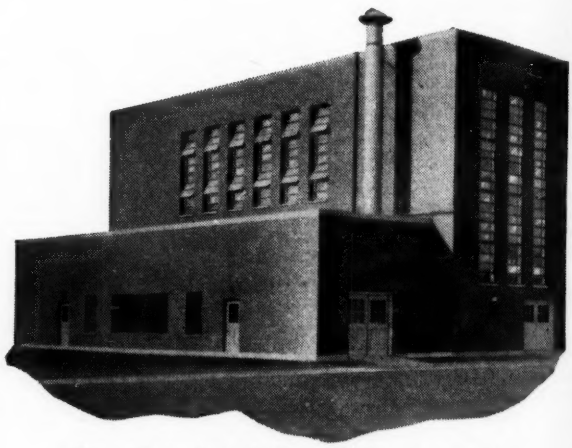
WITH THIS NEW RESEARCH PLANT

SWENSON *can help you obtain the advantages of Spray Drying*

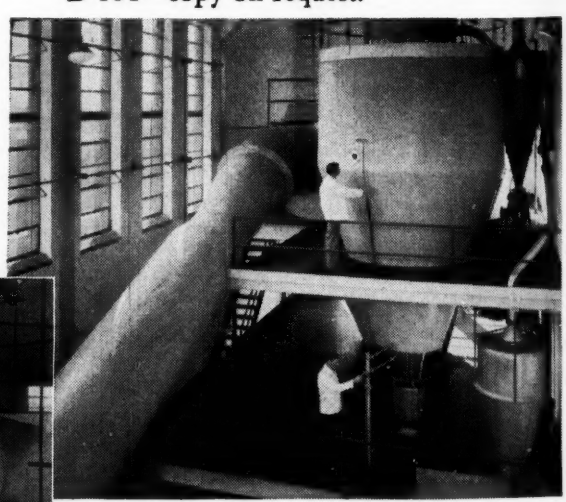
Now it is possible to conduct spray dryer tests of any pumpable, dryable food material on a production scale under normal operating conditions. New research facilities recently completed at Harvey, Ill., enable Swenson engineers to evaluate the use of spray drying for various foodstuffs, and bring its many advantages to new applications in the industry.

Any fluid or macerated material may be spray dried by the Swenson Gray-Jensen Process which operates at low (wet bulb) temperatures, retaining natural flavor and aroma as well as maximum vitamin and nutrient values. The powder consists of highly soluble particles of uniform size which require no further processing for packaging, shipment or reconstitution. The Swenson Gray-Jensen Process operates as a closed system, assuring complete sanitation and full recovery of solids.

Can spray drying improve your product? Swenson engineers will gladly consult with you and give any possible assistance in your drying problems.

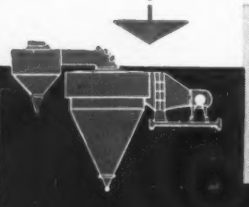


Complete description of these new research facilities contained in Bulletin D-101—copy on request.

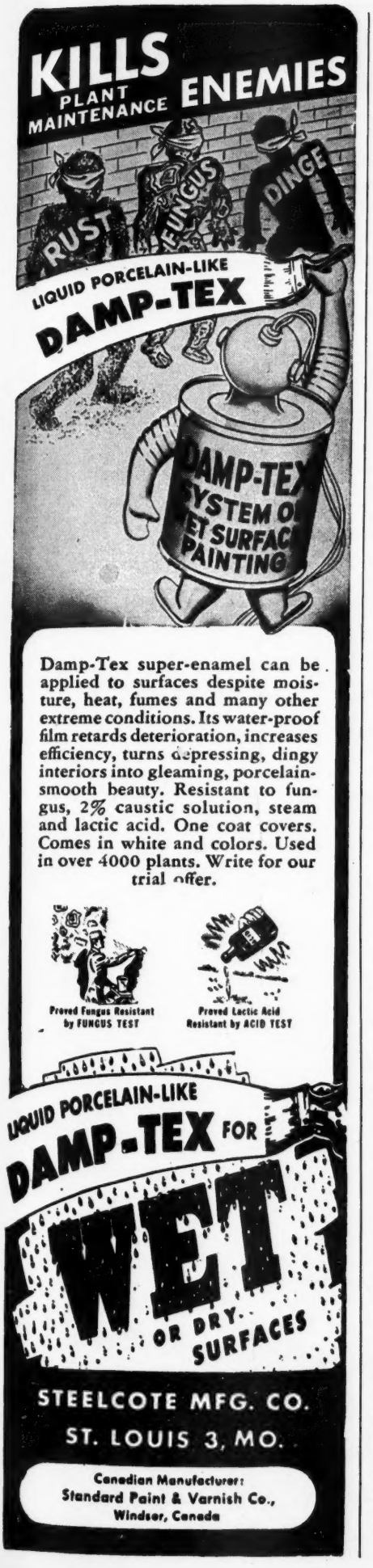


Main hot air duct and venturi; and (right) liquid collector and two powder collectors.

Top of drying chamber showing the exhaust duct leading to liquid collector in background.



SWENSON EVAPORATOR CO.
DIVISION OF WHITING CORPORATION
SPRAY DRYER DEPARTMENT, 221-B N. La Salle St., Chicago 1, Ill.
Export Department: 30 Church Street, New York 7, N. Y.


KILLS
PLANT MAINTENANCE ENEMIES
RUST
FUNGUS
DIRT
LIQUID PORCELAIN-LIKE
DAMP-TEX
DAMP-TEX SYSTEM OF WET SURFACE PAINTING
Damp-Tex super-enamel can be applied to surfaces despite moisture, heat, fumes and many other extreme conditions. Its water-proof film retards deterioration, increases efficiency, turns depressing, dingy interiors into gleaming, porcelain-smooth beauty. Resistant to fungus, 2% caustic solution, steam and lactic acid. One coat covers. Comes in white and colors. Used in over 4000 plants. Write for our trial offer.
Proved Fungus Resistant by FUNGUS TEST
Proved Lactic Acid Resistant by ACID TEST
LIQUID PORCELAIN-LIKE
DAMP-TEX FOR
WET
OR DRY SURFACES
STEELCOTE MFG. CO.
ST. LOUIS 3, MO.
Canadian Manufacturer:
Standard Paint & Varnish Co.,
Windsor, Canada

this recording rotameter and the Foxboro electronic recorder, great speed can be obtained. It is available for recording the rotor positions of many standard SK Rotameter designs, including the SK Universal Rotameter, the SK Armored Rotameter and others.

Plant Supplies

Washable Uniforms 78

E. R. Moore Co.—Folder "Smart Washable Uniforms for Women." Contains samples of materials in four colors. Also illustrates two styles of uniforms available in the Sanforized Aerocloth.

Rodent Control 79

LFC Corp.—Letter-file size leaflet, "Positive, Safe Rodent Control." Describes, with illustrations, the operation of LFC Guard, the electronic rat trap.

Shrinkage Control 80

"Shrinkage Control with Flavorseal" —11-page bulletin by Food Machinery Corp. describing advantages of Flavorseal protection for citrus fruits and vegetables.

Industrial Aprons 81

Hydro-Tex Corp.—4-page leaflet illustrating and describing the plastic industrial aprons equipped with permanently fused all-plastic eyelets made by this company.

Detergents 82

Oronite Chemical Co.—4-page folder giving the properties and applications of Oronite synthetic detergent, a compounding material for industrial washing and cleaning operations.

Alkalinity Indicator 83

TruTest Laboratories, Inc.—Bulletin describing a new indicator for faster determination of alkalinity of raw water, process water or boiler water.

Miscellaneous

Industrial Flooring 84

Walter Maguire Co.—Bulletin No. 603 features Emeri-Crete Flooring for use in various industrial plants.

Wire Rope Clamps 85

National Production Co. — 40-page booklet featuring the Safe Line wire rope clamps made by this company. Contains detailed sketches and cutaway views of this clamp with description of how it works. Many application photographs are given. Includes tabulated test results as well as tables of sizes, dimensions, weights and list prices.

Laboratory Equipment 86

Burrell Technical Supply Co.—Bulletin No. 205 on the Turner-Burrell Absorption Fractionator, specifically designed for light hydro-carbon analysis. Contains a discussion of absorption fractionation, a description of the apparatus, its utilization and operation.

Color Dynamics 87

Pittsburgh Plate Glass Co.—32-page booklet featuring the use of color in manufacturing and processing plants. The booklet demonstrates that by following the principles of color dynamics, efficiency of operation and quality of production can be improved. It shows how selecting the proper color schemes for industrial plants can bring about greater worker efficiency. Many applications of color dynamics applied to machines, walls, ceilings and floors are illustrated. Specifications for colored surface coatings to be used in different applications are given.

Want a PHONE CALL AT 3:00 A.M.?

When your night watchman calls at 3:00 a.m. to tell you that roof leaks are ruining stored supplies, repairs "tomorrow" aren't soon enough.

Immediate protection is as near as your drum of STONHARD PLASTIC ROOF RESURFACER . . . Instantly effective on any type roof, no heating or mixing required.

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PROBLEM: *In still water a man rows at the rate of 2 miles an hour. He rows down a stream which flows at 1 m.p.h. and reaches his destination in 10 minutes. How long will it take him to row back against the current?*

(Answer below)

It is easier to go with the current

Enrichment of foods has become a strong current in the processed food field. This current leads to greater consumer acceptance and surer profits.

To those who have not already done so, we strongly urge that you study the possibility of improving your product with 'Roche' vitamins.

Consult Roche—the company with the widest technical experience in the enrichment of food products.

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HOFFMANN-LA ROCHE, INC., NUTLEY 10, NEW JERSEY

"ENRICHED" a potent, one-word sales maker on your package

ANSWER: *30 minutes. (Why take 30 minutes when you can do a job in 10? Vitamin enrichment may give a similar vital advantage to your product.)*

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

PACKAGING

Packaging Dried Fruit

CONTINUOUS processing and packaging of dried fruit in liquid, with resulting improvement of product and reduction of cost, is accomplished by a method revealed in a recent patent. The successive steps are washing, pre-cooking, sorting, pressure cooking, hot filling, and closing. Pre-cooking is done at 212 deg. F. for from 3½ to 14 min. Pressure cooking is done in dry saturated steam between 220 and 260 deg. F. for one to four min. These steps condition the fruit for rapid absorption of liquid when packaged with hot filling sirup. The temperature of the latter is maintained above sterilizing temperature, so that sterilizing of the package is performed by the hot fruit and liquid themselves. The container may be either tin or glass. If carton pack is desired, a heat-sealing container of synthetic thermoplastic material in sheet form is used.

Digest from U. S. Patent 2,411,896, issued December 3, 1946, on an application dated March 18, 1942, to Burnell E. Richmond and Paul C. Wilbur, and assigned to Richmond-Chase Co., San Jose, Calif.

CANNING

Canning Fish

ACCORDING to a recent patent it is possible to preserve and can such fish as halibut, sole and cod, which usually become mushy, discolored and rancid when canned by methods successfully used for other fish. It has been found that when the liquid content is removed prior to sealing the can, the halibut will remain palatable for an indefinite period of storage.

After the fresh fish is cleaned, skinned and boned, and the dark fatty substance sometimes found between the skin and meat is discarded, the meat is filled into cans. These are passed, with the top ends open, through a dipping machine containing water at the boiling point. This loosens the cell structure and facilitates subsequent extraction of the undesirable liquid content. Following the hot water treatment the cans are immersed in water at about 50 deg. F. They then pass through a machine in which plungers compress the meat and allow the liquid to drain off or be drawn off by vacuum. The meat is then seasoned and the can filled with a vegetable oil, after which it is vacuum sealed. In addition to halibut, sole, cod, sand dabs, and other "bottom" fish, the process may be modified to be applicable to tuna, dogfish, crab meat and abalone.

Digest from U. S. Patent 2,411,188, issued November 19, 1946, on an application dated February 17, 1942, to Edward M. Borg, Seattle, Wash.

FATS and OILS

Keeping Quality Of Edible Oils

AFTER a long investigation on the effect of storage conditions and antioxidants on the keeping quality of packaged edible oils, the conclusion was reached that the most important factors are original good quality and protection against light. It was found that fresh corn and cottonseed oil have a satisfactory storage life if packed under conditions that prevent inclusion of air, and protection from light either by total exclusion or by use of amber glass bottles.

Many antioxidants were tested for periods as long as one year, but none proved as effective in preventing rancidity as total exclusion of light or partial exclusion by amber glass. Likewise, neither deaeration nor deodorization prevented deterioration of the oils when aged in the presence of light in sealed containers. At temperatures of 0 to 40 deg. F., fresh oils unexposed to light were of good quality at the end of a year. At 70 to 79 deg. F. deterioration was slight after 12 months' storage, but at 100 deg. F. the shelf life was less than three months. Complete discussion of results is given in the original article.

Digest from "Effect of Storage Conditions and Antioxidants on the Keeping Quality of Packaged Oils," by J. E. W. McConnell and W. B. Esselen, Jr., *The Journal of the American Oil Chemists' Society*, vol. 24, No. 1, 6-13, January, 1947.

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VITAMINS

Freeze-Drying Plasma

IMPROVEMENT in dehydrating a liquid or semi-solid product at low temperature under vacuum, particularly biological products such as serum and plasma, is the aim of a recently patented process. Compared with the present process, older methods are slow, awkward and inefficient, because their product is frozen in large masses that yield bulky chunks of dried material; also older methods cannot be carried out in a continuous manner. By contrast, frozen plasma will take up heat and lose water rapidly if it is in the form of small frozen particles, and if a mass of these particles is tumbled over a warm surface while exposed to vacuum.

The device used for producing small frozen particles is an injector. By this means a liquid or semi-solid substance may be exposed to a highly evacuated space in small volumes. The result is sudden and explosive freezing that produces small particles. One form of apparatus embodying the injector principle is a rotating drum warmed by a spray of water. The material to be dry-frozen is injected into one end of the drum, and vapor is exhausted from the opposite end by an exhaust

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IMPRINTS
CARTONS OR DRUMS
MOVING ON
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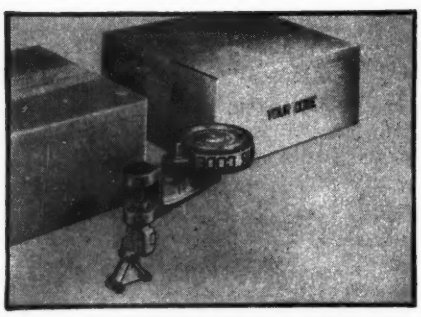

- Eliminate time and labor costs from case-marking operations! ROLACODER makes clean, precise imprint of code dates, lot numbers, content information on cases, crates, carton, kegs or drums . . . as they flow through packaging or sealing machine, or along conveyor.
- Models available to imprint from one to five lines. Interchangeable type feature permits easy changing of imprint legends.
- ROLACODER is friction-operated . . . requires no outside power source. Installed quickly, easily without altering present equipment.
- Write today for complete details . . . and state your *specific* marking requirements.

ADOLPH GOTTSCHO, INC. MARKING EQUIPMENT

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ASK FOR NEW MARKING MACHINE CATALOG

pump, passing through a vapor trap between drum and pump. Various forms of injectors and drying apparatus may be used, embodying the principle of sudden freezing and drying small particles of material.

Digest from U. S. Patent 2,411,152, issued November 10, 1946, on an application dated May 2, 1941, to Theodore R. Folsom, New York, N. Y.

Enriching Cereal Grains

THE endosperm of cereal grains can be enriched with natural water-soluble vitamins by steeping the whole grain in hot water under certain conditions of time, temperature and pressure. Enrichment can also be accomplished by steeping the grains in water which has been enriched with vitamins dissolved out of bran. The use of bran, however, is objectionable on account of the difficulty of separating the bran from the water containing the vitamin extract, due to the presence of starch which swells and becomes gelatinized. This obstacle can be avoided by substituting for bran the scutellum, a layer of the grain husk that lies between the germ and the endosperm. The scutellum has a high degree of attraction for vitamins of the B complex, but has a saturation point beyond which it will absorb no further vitamins. If this scutellum is separated from the bran and germ and ground to powder, its vitamin content is readily dissolved by water. Grain steeped in this solution will have its endosperm enriched. The scutellum may be ground dry or wet to a point where the particles are approximately the size of the starch granules of the endosperm.

Digest from U. S. Patent 2,412,153, issued December 3, 1946, on an application dated August 30, 1943, to Erich G. Huzenlaub, Brentford, England.

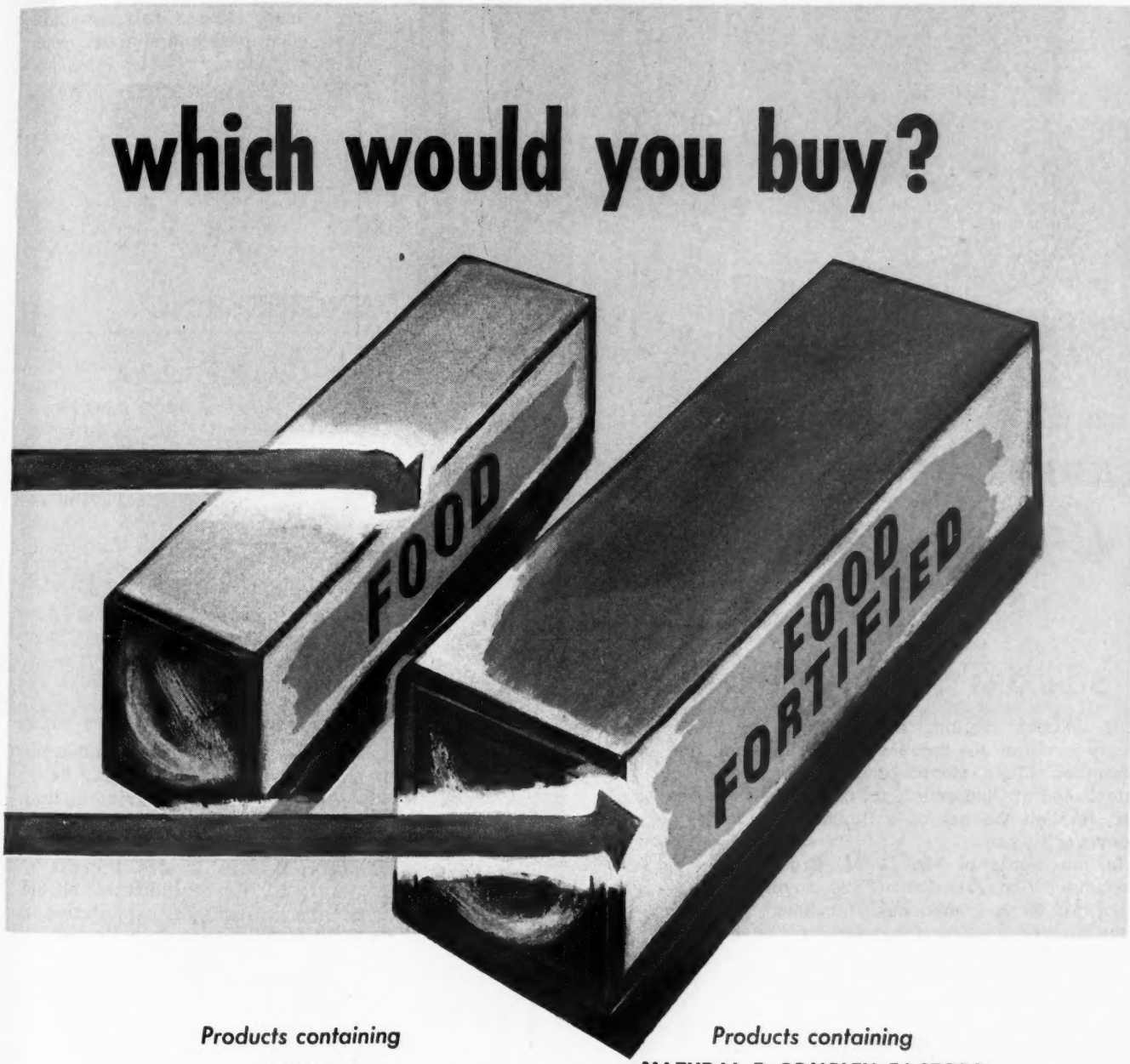
Vitamin Content of Foods During Canning

STUDIES have been made to determine vitamin losses from nine vegetables and one fruit at various steps in commercial canning procedures. Extensive tabular data can be summarized as follows:

Ascorbic acid retention was excellent in tomatoes and tomato juice; good in cherries and carrots; fair in asparagus, corn and spinach; poor in snap beans, lima beans and peas. Carotene retention was excellent in asparagus, cherries, spinach and tomatoes; good in carrots, corn, peas and tomato juice; fair in snap beans. Thiamin retention was excellent in tomatoes;

(*Continued on page* 188)

which would you buy?



Products containing
VITAMIN D

Fleischmann's Hy-Dee
Irradiated Dry Yeast

Fleischmann's Irradiated Dry Yeast
Type 700-H

Standard Brands Viosterol
(Activated Ergosterol) Steenbock Process

Products containing
NATURAL B-COMPLEX FACTORS

Fleischmann's
Pure Dry Primary Yeasts *(Brewer's Strain)*

Fleischmann's
Bee-Flex Products

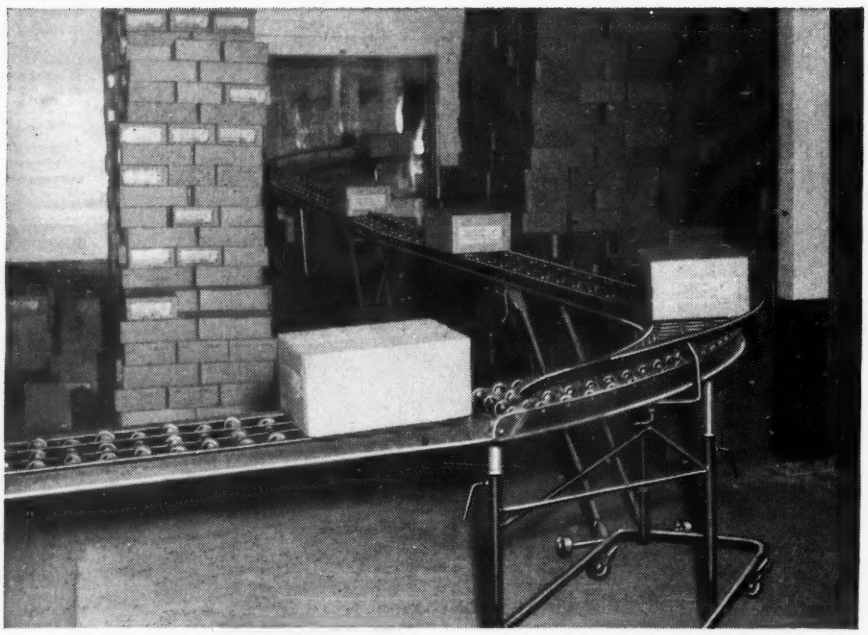
Fleischmann's
Brewer's Yeast Extract Types 3 and 41

Fleischmann's
Yeast Extract and Liver

STANDARD BRANDS INCORPORATED

Strong Cobb Division

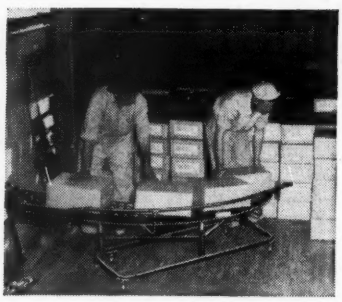
Bulk Pharmaceutical Department • 595 Madison Avenue • New York 22, N. Y.



RAPIDS-STANDARD CONVEYORS

Cut Labor Costs

$250.00 PER WEEK



Fast, efficient handling of the cases and empty jars from the time they enter the plant, throughout filling, storage and loading is accomplished at Cinderella Foods, Inc., Dawson, Ga., through the use of a Rapids-Standard Conveyor System.

In the words of Mr. C. M. Cruikshank, Executive Vice-President: "The savings in labor for us is tremendous. I estimate that your gravity track and boosters are saving us from $200 to $250 each week. We just couldn't do without them and if no more were available, we wouldn't sell them for five times what they cost."

The Rapid-Wheel Gravity Conveyor and The Stevedore, Jr. (Power Belt) Booster make a handling team in this plant that eliminates all strenuous lifting and hand moving. Cartons placed on the conveyor at the loading dock move on to their destination without rehandling. Stevedore, Jr. does the heavy lifting work and Rapid-Wheel Conveyor carries the cases through the plant by cost-free gravity. Cases move in a minimum of space all the way and traffic problems are non-existent. Both Stevedore, Jr. and Rapid-Wheel Conveyors are easily portable and can be quickly set up in any part of the plant or warehouse.

Check into the advantages of this cost reducing equipment today. What it has done for hundreds of others it can also do for you. It COSTS NOTHING TO GET FULL PARTICULARS. WRITE TODAY FOR FREE LITERATURE.

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good in tomato juice; fair in asparagus and carrots; poor in snap beans, lima beans, corn, peas and spinach. Riboflavin retention was excellent in asparagus, tomatoes and tomato juice; fair in lima beans, corn, peas and spinach; poor in snap beans. Niacin retention was excellent in asparagus, spinach, tomatoes and tomato juice; fair in carrots and corn; poor in lima beans and peas.

Digest from "The Nutritive Value of Canned Foods," by N. B. Guerrant, M. G. Vavich, O. B. Fardig, R. A. Dutcher and R. M. Stern, *The Journal of Nutrition*, vol. 32, No. 4, 435-458, October, 1946.

ENGINEERING

Fine-Grinding Ball Mill

INFORMATION has been released on a German ball mill, capable of grinding pharmaceuticals and food products as fine as one micron. Novel feature of the mill is the peculiar motion which the vibration of its shell imparts to the pulverizing balls. The shell is mounted on steel springs, and a rotating eccentric shaft in a sleeve bearing passing through the mill, combined with the action of the springs, provides the agitating motion. The laboratory size mill (0.3 l.) receives 1,450 vibrations per min., and the larger sizes (up to 250 l.) receive 1,000 per minute. Shell and balls may be of steel or porcelain, and grinding may be either wet or dry. The mill can not handle material coarser than 0.02 to 0.03 in. in size. Patents by the I. G. Farbenindustrie should now be available for exploitation in the United States.

Digest from Release by Office of Technical Services, Department of Commerce, Washington 25, D. C., abstracted from 20-page report "Vibrating Ball Mill for Pulverizing Fine Materials," by Paul M. Tyler, Hobart Publishing Co., Box 4127, Chevy Chase Station, Washington 15, D. C. $2.

MATERIAL

Silica Aerogel Insulation

SILICA aerogel is a product of dehydrating silica jelly in such a manner that the liquid phase is replaced by air without destroying the gel structure. In this respect it differs from silica gel widely used for dehydration, and for the same reason finds extensive use as thermal insulation. Silica aerogel is a voluminous solid having a density of about seven pounds per cu. ft., approximately 94 percent of its volume being air. It will not pick up

Champion Thunderbolt of Inglehills, Inglehills Kennels, Inglefield, Ind. Shown by Richard E. Cooper

In a Dog ~ it's Breeding

In Seasoning ~ it's Stange

•Among all the factors that spell success in the merchandising of food products—none is so vitally important as FLAVOR. Recognizing the problems of food processing companies in connection with quality and uniformity of flavor, Stange has specialized in the science of seasoning wherever the flavors of natural spices are desired in quantity production —Cream of Spice Seasonings.

•In Cream of Spice Seasonings, through the exclusive Stange process of total extraction, you get a seasoning containing ALL the essential oils and aromatic oleo resins of the NATURAL spices in a concentrated, easy-to-use form—with all foreign matter and unsightly waste material discarded.

•Every Cream of Spice Seasoning has the same degree of strength—it's instantly soluble —it comes as an individual spice flavor, such as cinnamon, celery, pepper; or in pre-mixed blends, such as apple butter seasoning, chili sauce seasoning, seasoning blends for packers of dehydrated soups, and seasoning for meat and sausage makers.

•The Stange research laboratories and Home Economics Staff will gladly help you on any seasoning problem you may have.

42 YEARS OF SERVICE TO THE FOOD INDUSTRY

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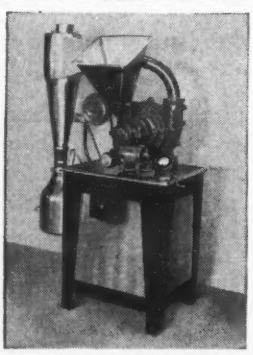
New No. 8 MIKRO-ATOMIZER

The No. 8 MIKRO-ATOMIZER represents a new and larger production unit capable of producing ultra-fine powders as low as 1 to 25 microns (under 325 mesh) in size. Using a 75 h.p. motor, this new mechanical screenless pulverizer is particularly applicable to tonnage operations.

Although having almost four times the size and capacity of the No. 6 MIKRO-ATOMIZER, the new unit retains all the features and basic principles that have made these new type pulverizers so popular in a varied number of plants. Guaranteed control of particle size is offered as with the smaller machine.



No. 5 MIKRO-ATOMIZER for small quantity production, pilot plant and laboratory work.

Compact and highly efficient, the new No. 8 MIKRO-ATOMIZER discharges into a stainless steel dust collector. Rotary air lock for continuously discharging material from the cyclone, is supplied. A number of modifications of the No. 8 machine are available in order to accommodate the wide range of different materials for which it is recommended.

A new No. 8 MIKRO-ATOMIZER purchased for your plant can provide increased tonnage of ultra-fine powders. Send for your copy of new bulletin and arrange for a free test grind of your material in a MIKRO-ATOMIZER.

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MIKRO-PULVERIZER (FINE)

MIKRO-ATOMIZER (ULTRA FINE)

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appreciable amounts of water vapor from the air. Nevertheless its insulating qualities are destroyed by liquid water. Natural settling equilibrium, about two percent reduction in volume, is reached in five hours. Aerogel offers no fire hazard, nor is it silicotic. With these properties, it offers opportunity for changes in insulating design and practice. It has been used with marked improvement in refrigerators, freezing cabinets, tank trucks, and storage tanks. Although not available commercially, an improved form of aerogel has been developed weighing three and one-half to four pounds per cubic foot.

Digest from "The Use of Silica Aerogel as a Thermal Insulation," by F. F. Ogden and J. F. White, *Refrigerating Engineering*, vol. 52, No. 5, 411-414, November, 1946.

QUALITY CONTROL

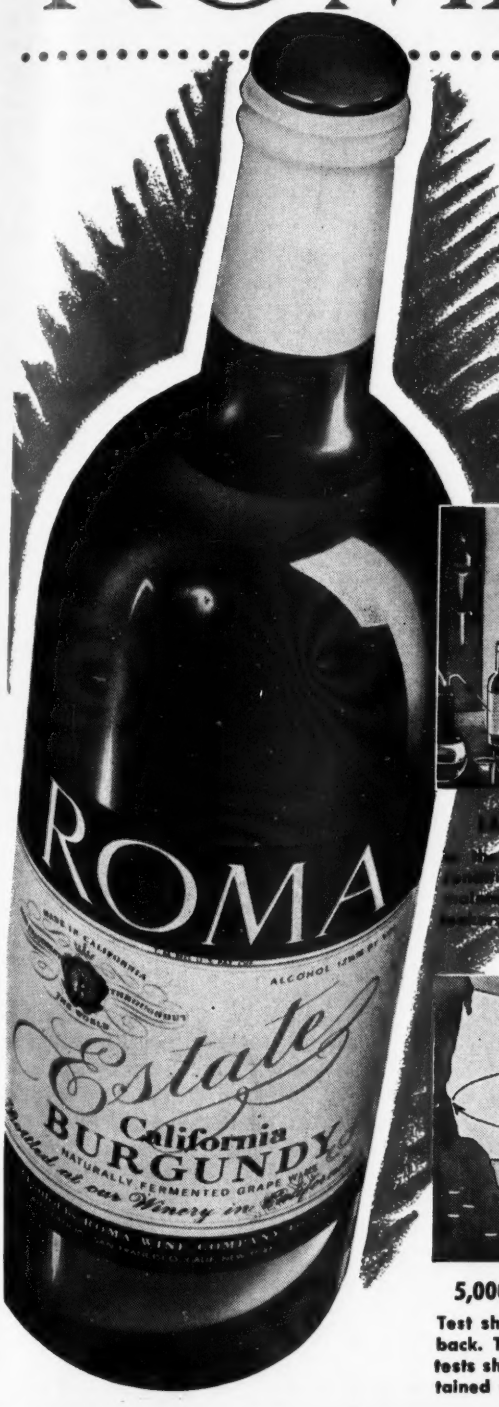
Nitrite Determinations In Brine and Cured Meat

NITRITE determinations on brines or meats cured in them are commonly made by addition of a solution of alpha-napthylamine and sulphanilic acid in dilute acetic acid (Greiss-Ilosvay reagent) to an extract of the meat or to diluted brine. A magenta color results which is compared with the colors produced by solutions containing known amounts of nitrite as standards.

The usefulness of the method has been increased, by determining the conditions under which the color develops rapidly and remains stable for a reasonable period of time, and by drawing curves from the colorimetric measurements. The sodium chloride concentration, and temperature of the brine, affect the intensity and development time of the color. At 98 deg. F. the maximum color is reached in 11 min. in the presence of at least 0.5 percent NaCl. The lower temperature is preferable to a boiling water bath, since the reaction producing this color is one of diazotization and coupling.

Up to 0.2 percent NaCl concentration, the maximum color intensity is not reached, but in the range 0.3 to 1.0 percent the intensity is substantially constant. The Greiss-Ilosvay reagent increases the color intensity as its concentration increases and it is necessary to adopt an arbitrary volume of reagent for addition. Three ml. was adopted as a satisfactory amount.

ROMA ADOPTS ALSECO CAPS

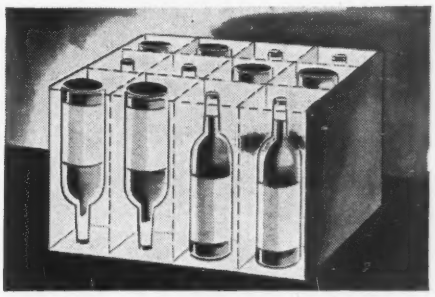


GRUELLING TESTS PROVE ALSECO SEALING EFFICIENCY

Searching for a better seal to protect wines against shipping and storage hazards, Roma Wine made exhaustive tests with Alseco Caps. After all the rough treatment they could devise, Alseco Caps still gave positive sealing; still were easy to open. An Alseco representative will be glad to show you how tailor-made Alseco Caps can provide better sealing for your products.

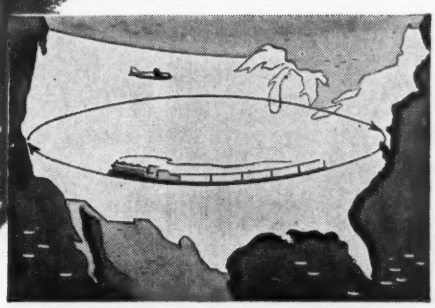
LABORATORY TESTS CAME FIRST

In the Roma laboratory, tougher-than-actual conditions were simulated. Here, Alseco Caps maintained a uniform vacuum; showed no leakers or breathers.



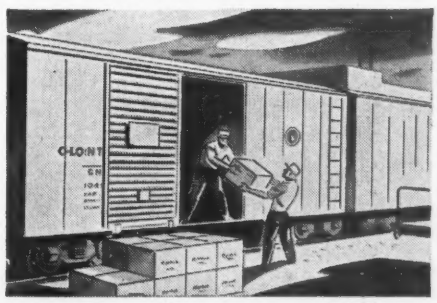
PACKED UPSIDE DOWN AND RIGHT SIDE UP

Test shipments were packed in standard shipping cases. In each case, half the bottles were placed upside down. Roma wanted to be doubly sure that Alseco Caps stand up in use.



5,000 MILES BY PLANE AND TRAIN

Test shipments went from coast to coast and back. Then bottles were stored. Weeks later, tests showed that every Alseco Cap had maintained original vacuum.



ALSECO CAPS PASS EVERY TEST

Later, full carload shipments were made, subject to everyday shipping and handling hazards. Again Alseco Caps passed the test. In no instance was there failure to maintain a positive vacuum.

ALSECO SEALS AND SEALING MACHINES

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The volume of solution also affects the color development, higher dilutions reducing the final density somewhat. Fixed solution volume is therefore necessary especially for higher nitrite contents.

A Spekker absorption meter was used for obtaining a calibration curve. A fairly satisfactory curve was also obtained with the Lovibond Tintometer by plotting Lovibond Red Units against nitrite concentrations. Nessler tubes and a series of standards may be used also. The colors are stable for at least one day in diffused light at room temperature. The minimum accuracy of the method, tested on known nitrite additions to meat curing brines is about one percent, that is, additions of 840 ppm. of sodium nitrite were indicated by the method to be 830 ppm.

Digest from "The Determination of Nitrite in Brines and Cured Meats," by J. C. Morpeth, *Chemistry and Industry*, 370-372, Oct. 12, 1946.

Examination of Gases In Food Containers

SPECIAL apparatus has been devised for the measurement and analysis of gases found in vacuum-packed and gas-packed food containers. The method is applicable to all kinds of containers, and for the measurement of gas volumes as small as one c.c. Equipment and procedure are especially useful in the examination of small packages—4 oz. or less—of dry food products. The apparatus also permits determination of the true density of dry powdered or granular materials such as coffee, milk powder, and dehydrated soups. Permeability of packaging material also can be determined. Reference must be made to the original article for detailed description of the apparatus and its operation, as well as for tabulated data on application of the method to peanuts, milk powder, and ground coffee in vacuum-packed and gas-packed cans and in flexible containers.

Digest from "Measurement and Analysis of Gases in Vacuum-Packed Food Containers," by L. C. Cartwright, *Industrial and Engineering Chemistry*, analytical edition, vol. 18, No. 12, 779-785, December, 1946.

Egg Yolk in Egg White

PRESENCE of only a trace of egg yolk in bulk egg whites will noticeably affect quality and performance of the latter in bakery products. It becomes desirable, therefore, to evolve a method for determination of quantities as low as 0.05 percent of yolk in white. The obvious approach is to select some constituent

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***Pharmaceutical Manufacture*—in synthesis of analgesics, antipyretics, antispasmodics, and other organic products.**

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of yolk not present in white, and bearing a close correlation to the actual amount of yolk present. Cholesterol has been found to meet these conditions, and a method has been evolved for its determination in very small quantities. The procedure involves extraction of the cholesterol with ammonia, alcohol, ethyl ether, and petroleum ether; development of characteristic color by the addition of acetic anhydride-sulphuric reagent; matching the developed color with standards prepared from pure cholesterol treated in the same manner, using a Coleman spectrophotometer. Reference must be made to the original article for details of procedure, and for data showing the constant relationship between cholesterol content and presence of egg yolk.

Digest from "Determination of Egg Yolk in Egg White," by J. H. Cook and V. C. Mehlenbacher, *Industrial and Engineering Chemistry*, analytical edition, vol. 18, No. 12, 785-788, December, 1946.

MISCELLANEOUS

Testing Food by Taste

CONSIDERING the importance of taste as a property of food, it is unfortunate that this quality cannot be expressed quantitatively. Nevertheless much can be done to take taste testing out of the realm of guess work, and deal statistically with the results obtained by taste panels. Principles of taste testing can be established, and taste panels can be selected with reasonable assurance of discovering qualified "experts." The articles here reviewed were written by Swedish and Danish brewers and have special applications to the brewing industry. They are, however, so fundamental in their treatment of the subject that they can well be applied to other food industries.

Ten principles of taste testing are laid down: Select and store samples properly; limit the number of samples; train a large group of tasters; determine the most suitable mode of consumption; create an atmosphere of quiet and concentration for the tests; use containers that impart no taste or odor to the samples; use blind samples and require written opinions; require each taster to work independently; if possible, announce the object of the test; and, bearing in mind the number and mode of selecting tasters, determine what the results actually show.

Selection of a taste panel can be

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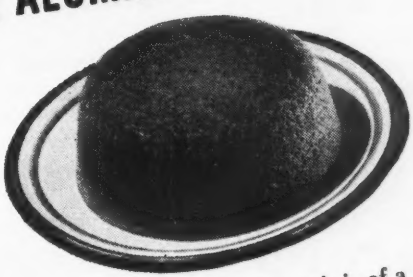
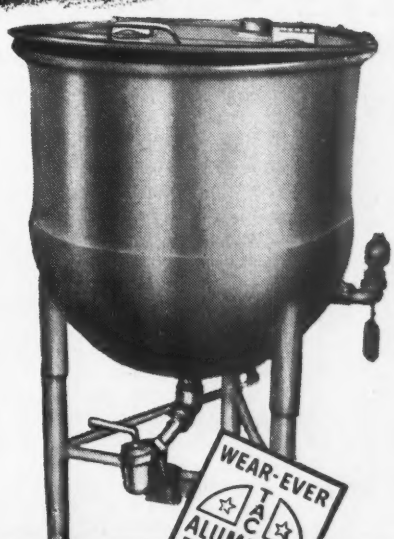
Wear-Ever Aluminum spreads heat so quickly, so evenly, that even a tiny candle flame is sufficient to bake a cake. With ALL Wear-Ever aluminum equipment, the *whole utensil cooks the food*, not just the bottom.



This unretouched photograph is of a cake actually baked in a Wear-Ever pan by the heat of a candle. And it takes only about as long as your own oven would take.



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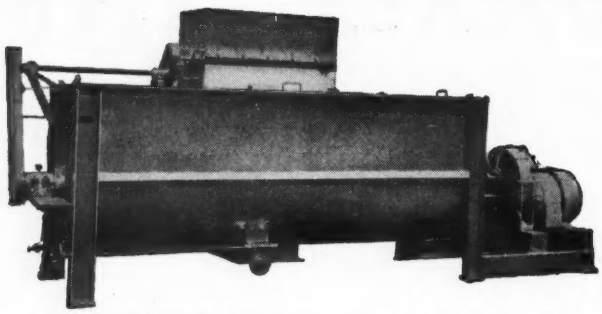

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accomplished by a process of elimination, starting with a large number of tasters and carefully analyzing the results of a number of tests. In the case under consideration, four series of beers were tasted by 70 persons once or twice a week for a total of 24 times. Thus about 1700 answers were obtained in each series, the object being to differentiate between two well defined beers. Statistical analysis of the results revealed a group of 20 tasters with a percentage of correctness of 76. The age group 30 to 39 showed maximum sensitivity. No difference could be observed in the ability of smokers and non-smokers, but probably no broad conclusion should be drawn from this instance, or with respect to the age group, because the number of persons participating was not sufficiently large. Brewers and chemists showed the highest degree of proficiency, and foremen the lowest. Tasters of superior ability showed improvement in the course of the 24 tests, but no improvement was shown by the inferior group.

Digest from "Principles of Taste Testing," by K. Bengtsson and E. Helm, and "Selection of a Taste Panel," by E. Helm and R. Trolle, *Wallerstein Laboratories Communications*, vol. 9, No. 28, 171-180 and 181-194, December, 1946.

Food Preservation

ULTRA-VIOLET radiation, instead of prolonged heating at bactericidal temperatures, to render preserved food sterile within a hermetically sealed package is the principal feature of a recent patent. The process is dependent on the use of a container material that is transparent to ultra-violet radiation and impervious to moisture and gases. It should also be flexible and insoluble in water and food acids. Such containers may be made of films of several synthetic resins or rubber-like materials which can be sealed by heat. The inventor claims that the process does not impair the natural taste or appearance of the preserved food; also that it will not only minimize the destruction of vitamins, but may actually restore and often increase them in foods containing fatty esters. In operation of the process the containers pass successively through filling machines, vacuum sealer, cooler, and ultra-violet sterilizer, the latter yielding light having wave lengths ranging between 2,000 and 2,950 Angstrom units.

Digest from U. S. Patent 2,401,131, issued May 28, 1946, on an application dated April 11, 1941, to D. Bensel and assigned to Bensel-Brice Corp., Los Angeles, Calif.

BOOKS

Biochemical Text

PRACTICAL PHYSIOLOGICAL CHEMISTRY, Twelfth Edition. By Philip B. Hawk, Bernard L. Oser and William H. Summerson. Published by The Blakiston Co., 1012 Walnut St., Philadelphia, Pa., 1947. 6¼x9½ in.; 1321 pages; cloth. Price, $10.

The ten years since the appearance of the eleventh edition of this book is the longest interval in its 40 year history. Naturally many new experiments, tests, methods and preparations have developed. The sections on these developments and on advances in such fields as the composition of foods and on the various vitamins, make this edition particularly noteworthy to the food chemist.

Wine Production

THE PRINCIPLES AND PRACTICE OF WINE MAKING, Second Edition. By W. V. Cruess. Published by Avi Publishing Co., 31 Union Sq., New York 3, N. Y., 1947. 5½x8 in., 475 pages; cloth. Price, $7.50.

A lot of grapes have been crushed since the original edition of this treatise was published in 1934, shortly after Prohibition's repeal. Progress, in the intervening years, in the technology of wine making, as well as in knowledge of the principles underlying the various operations in wine production, have prompted the author to virtually rewrite the book.

From the first chapter, which describes the wines and wine regions of the world, on through the growing, gathering and crushing of the grapes, to the treatment and bottling of the different wines, the book reveals in detail the methods that have gained approbation from the world's leading wine makers. There is also a section on laboratory examination of wines that should hold interest for the wine chemist and the wine producer alike.

Halt Accidents

ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPERATIONS. Published by National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill., 1946. 6x9 in.; 534 pages; cloth. Price, $7.

The accident prevention record of the food industry is not a proud one despite some notable exceptions. The rating of the industry as a whole is annually far from the top. This book describes in minute detail safety measures that have proved their value in all industries and should therefore hold wide interest for the food plant operator.

It is estimated that accidents cost American industry close to $2,000,000,000 a year. But this is only the cash outlay. The distress suffered by the victims and by all those around them can not be measured, but must certainly affect the efficiency of the working force.

The manual sets forth the principles of safety for activities in which the great majority of manufacturers engage. It offers as much detail as is possible in a general application.

Trade-Mark Act

THE NEW TRADE-MARK MANUAL. By Daphne Robert. Published by The Bureau of National Affairs, Inc., Washington 7, D. C., 1947. 6⅛x9¼ in.; 373 pages; cloth. Price, $6.50.

A manufacturer's trade-mark is his symbol of identification. The quality of his product, his integrity, in fact his whole reputation, built up through the years, are all represented in that designation. It does not expire with a patent or with the publication of a secret process.

The Lanham Trade-Mark Act protects this representation. And this book, foregoing the usual legal obscurity, explains the Act. It brings together an analysis along with the texts of all the laws under which interstate and foreign trade-mark users may obtain fullest protection.

The food plant executive, with trade-marks to protect, can read this treatise without the aid of the company attorney. And the company attorney should find it a convenient addition to his library.

Carbohydrate Research

ADVANCES IN CARBOHYDRATE CHEMISTRY, Volume 2. Edited by W. W. Pigman, M. L. Wolfrom and Stanley Peat. Published by Academic Press, Inc., 125 E. 23rd St., New York, N. Y., 1947. 6½x9½ in.; 323 pages; cloth. Price, $6.60.

Carbohydrate chemistry has been no exception in the general trend toward broader and deeper research. The first volume of this series, published during the war,

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derived its material solely from American authors. This second volume has four from England, one from France.

Of the ten papers that make up the volume, four hold particular interest for the food chemist. "The Interrelation of Carbohydrate and Fat Metabolism," by Harry J. Deuel, Jr. and Margaret G. Morehouse, and "The Chemistry of Pectin Materials," by E. L. Hirst and J. K. N. Jones are two. A third is "Analogs of Ascorbic Acid," by F. Smith and a fourth "Melezitose and Turanose," by C. S. Hudson.

GOVERNMENT PUBLICATIONS

The following recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the bureau responsible for its issue.

APPARATUS FOR DETERMINING WATER-VAPOR PERMEABILITY OF MOISTURE BARRIERS. By Frederick T. Carson and Vernon Worthington. National Bureau of Standards, Circular C453. Price 10 cents.

ANNUAL REPORT OF THE COMMISSIONER OF INTERNAL REVENUE, FISCAL YEAR ENDED JUNE 30, 1946. Contains annual alcohol tables. Price 40 cents.

RICE PRODUCTION AND MARKETING IN THE UNITED STATES. By G. A. Collier. Department of Agriculture, Miscellaneous Publication 615. Price 10 cents.

MAPLE PRODUCTS, 1916-46. Bureau of Agricultural Economics. Multilithed.

LIST OF COMMERCIAL STANDARDS. National Bureau of Standards, Letter Circular LC842. Indicates standards recommended as of January 1, 1947. Numerous recommendations relate to industrial equipment and items of factory interest. Does not include any standards for food itself. Mimeographed.

STANDARDS FOR GRADES RECENTLY ISSUED BY THE PRODUCTION AND MARKETING ADMINISTRATION; STANDARDS FOR GRADES OF CANNED DRIED BEANS; FOR GRADES OF CANNED SWEETPOTATOES; FOR GRADES OF DATES; AND FOR GRADES OF CANNED TANGERINE JUICE. All available on request Production and Marketing Administration, Department of Agriculture, Washington 25, D. C. Mimeographed.

PATENTS

CEREAL PRODUCTS

Bread Made to Consist of Rye Flour, Water and Salt with as Much as 6 Percent of Undissolved Salt Crystals Dispersed Through Dough—Maurice M. Jackson and Edward Hauser to The Vienna Model Bakery, Inc., Chicago, Ill. No. 2,412,154. Dec. 3, 1946.

Soya Protein in Aqueous Alkaline Solutions Clarified and Freed From Gummy and Mucilaginous Bulk Impurities by Addition of Alkali Metal Acetate—Sherburne B. Henning, Evanston, Ill. No. 2,415,426. Feb. 11, 1947.

ENGINEERING

Bakery Doughs Made in Mixer Equipped with Conduits for Refrigerant on Inner Wall to Provide Resistance to Movement of Ingredients Under Mechanical Agitation as Well as Cooling—Merlin A. Sticelber, Kansas City, Mo., to Quik-Seal, Inc. No. 2,415,711. Feb. 11, 1947.

Butter and Similar Edible Spreads Mechanically Cut and Molded into Individual Units—Charles Doering, Henry H. Doering, Eric W. Anderson and Bert J. Skoglund, Chicago, Ill., to Charles Doering and Henry H. Doering. No. 2,411,616. Nov. 26, 1946.

Coffee Roasted and Cooled in Self-Contained Combination Unit—Sanford E. Richeson, Brooklyn, N. Y. No. 2,415,307. Feb. 4, 1947.

Eggs Mechanically Graded on Weight Basis—Matthew B. Wrobley, Kansas City, Mo. No. 2,415,549. Feb. 11, 1947.

Finely Divided Casein in Liquid Suspension Recovered by Gyratory Motion of Inclined Screen—Edward J. Wendt, Elroy, Wis., to Hercules Powder Co., Wilmington, Del. No. 2,415,268. Feb. 4, 1947.

Grains Mechanically Dried in Unit Equipped with Preheater of Incoming Air Utilizing Exhaust Gases from Primary Heating Compartment—Albert B. Welty, Moline, Ill., to International Harvester Co. No. 2,410,851. Nov. 12, 1946.

FATS AND OILS

Color Development in Fatty Material Containing Gum Guaiac in Presence of Metals Substantially Retarded by Addition of Acid Reacting Agent—Howard C. Black to Industrial Patents Corp., Chicago, Ill. No. 2,408,904. Oct. 8, 1946.

Glyceride Oils Freed from Free Fatty Acids by Treatment with Selective Solvent, from Gums by Water Containing Degumming Reagents and from Color Impurity by Treating with Dilute Alkali Solution—Howard C. Black and Walter F. Bollens to Industrial Patents Corp., Chicago, Ill. No. 2,416,146. Feb. 18, 1947.

FRUITS AND VEGETABLES

Fruits and Vegetables to Be Dehydrated Freed from Air by Vacuum Without Destruction or Distortion of Cell Walls—Harold K. Derby, Berkeley, Calif., to F. E. Booth Co., Inc., San Francisco, Calif. No. 2,415,995. Feb. 18, 1947.

Fruit Peeled by Mechanical Means Operating in Horizontal Plane—Enrique Juan Rios y Marquez Lawton, Havana, Cuba. No. 2,410,683. Nov. 5, 1946.

Fruits Such as Cherries Pitted by Mechanical Means—Burton C. Coons to Food Machinery Corp., San Jose, Calif. No. 2,415,418. Feb. 11, 1947.

PACKAGING

Fluids Packaged in Bags with Non-Leak Closure—John G. Vergobbi to Pneumatic Scale Corp., Ltd., Quincy, Mass. No. 2,415,978. Feb. 18, 1947.

Milk Packaged in Carton Constructed to Have Cream Chamber with Valve for Controlling Opening Between Milk and Cream Chambers—Arthur Read, Portland, Ore. No. 2,413,845. Jan. 7, 1947.

Packaged Foods Cartoned in Multiple Units by Mechanical Means—Charles M. Lamb, Jr., and Harold Merrill Wyman, Jr., Flushing, N. Y., and Vincent E. Heywood, Worcester, Mass., to United States Envelope Co., Springfield, Mass. No. 2,415,292. Feb. 4, 1947.

MISCELLANEOUS

Lactic Acid Esters Made by Reaction with Higher Alcohols in Presence of Metal Alkoxide as Catalyst—John Leslie Jones to Libbey-Owens-Ford Glass Co., Toledo, Ohio. No. 2,410,740. Nov. 5, 1946.

Naturally Colored Egg Shells Whitened by Treatment with Solution Containing Oxidizing Agent—James D. Ingle to Industrial Patents Corp., Chicago, Ill. No. 2,413,631. Dec. 31, 1946.

Poultry Defeathered by Force of Water Directed in High Velocity Streams—Lenus Jasper, Orland, Calif., to Seth S. Barker, Ottumwa, Iowa. No. 2,412,338. Dec. 10, 1946.

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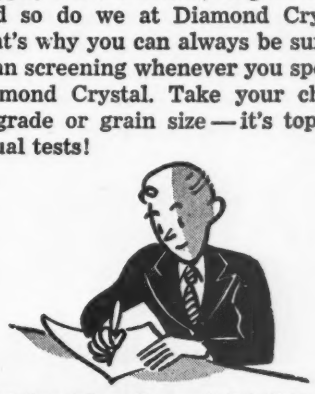

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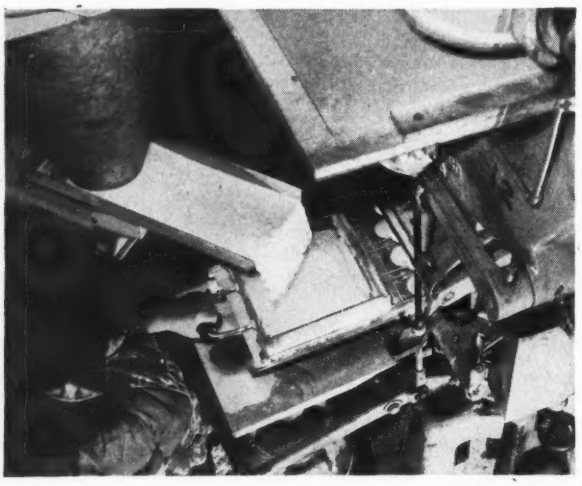

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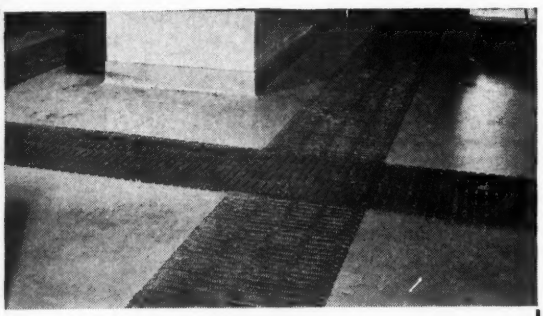

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Maturity of Peas

(*Continued from page* 106)

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19. A. F. Muenchow, How to Grade Peas for Quick Freezing, Tenderometer Reading vs. Tenderness and Maturity Scores by Brine Flotation Tests, *Western Canner and Packer*, vol. 33, 41-43, 1941.
20. E. L. Birdsall, Sample Separator Speeds Grading, *Food Industries*, vol. 16, 273-274, 1944.
21. J. P. Nielsen, H. Campbell and M. M. Boggs, Tenderizing Vegetables for Freezing by Blanching in Sodium Hexametaphosphate Solution, *Western Canner and Packer*, vol. 35, 49, 1943.

*See March issue, Part I of this report, for other references.

—*End*—

Wax Coating

(*Continued from page* 77)

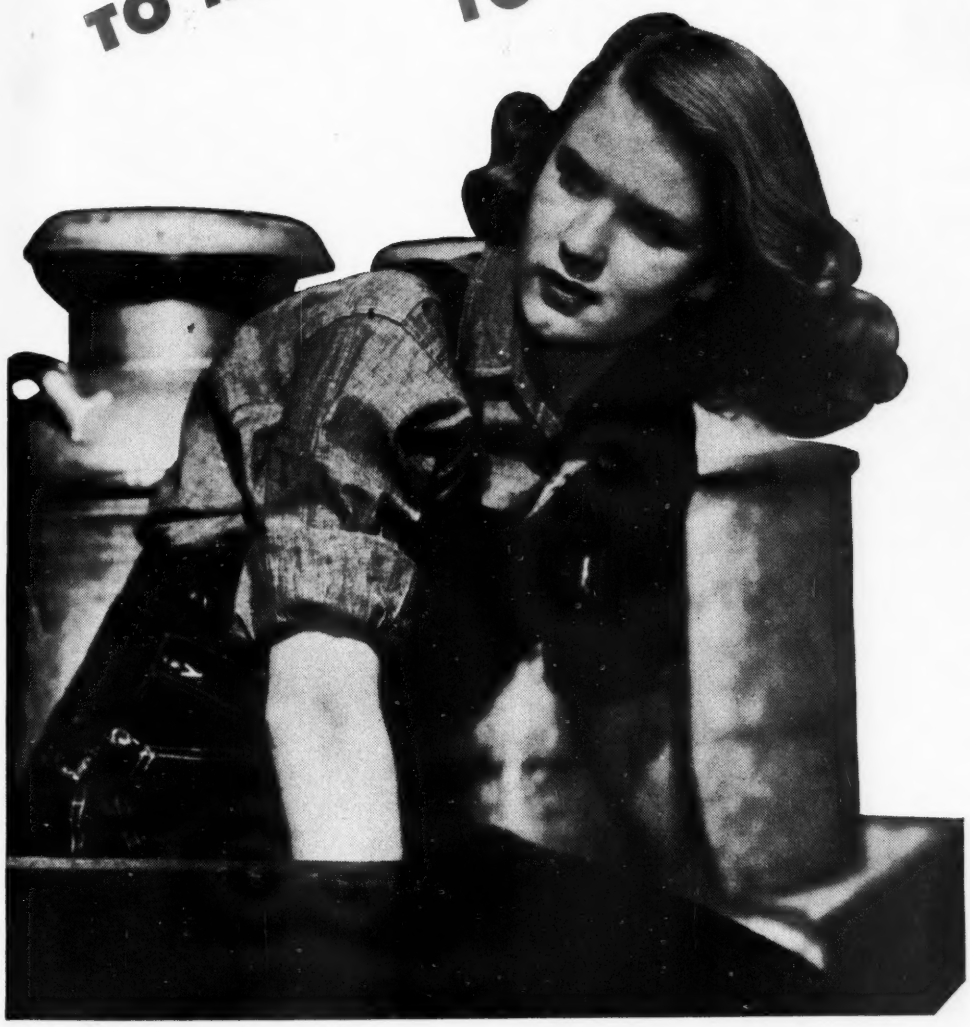
veloped by the Wallis Systems, freezes 400 to 500 lb. of meat an hour. Products, placed on the end of the freezer in the processing room, emerge frozen from the other end and ready for the dip coat application. The frozen product is then dipped and prepared for storage.

Dipping Tank

Several types of thermoplastic waxes are available. Each requires a specific dipping temperature for proper application. Dipping temperatures range from 130 to 170 deg. F. In some instances thermoplastic wax is applied at temperatures above 212 deg. F.

A dipping tank has been designed for small operations, such as locker plants. It is equipped with a preheater for adding additional wax to maintain the proper level in the tank's reservoir. The tank holds approximately 200 lb. of wax. Depending on size, between 500 to 1000 lb. of meat per hour can be dip-coated.

TO MARKET, TO MARKET



and what happens THEN

EVERY day in the year, on its way to America's tables, a flood of milk moves into the shining plants of the great Dairy Industry—there to be pasteurized and processed, predominantly in equipment made of stainless steel.

Stainless steel, ever since the advent of Allegheny Stainless, this nation's pioneer, has proved itself *the one metal* that most perfectly meets a dairy plant's need for corrosion-resistance, sanitation and ease of cleaning. Stainless steel today is one of the big reasons why you enjoy the world's finest dairy products—pure and wholesome, fresh and full-flavored—a happy state of affairs in which Allegheny Ludlum, as the largest producer of stainless steel, has had a major role.

W&D 213-B

We produce stainless steel in all of its forms, and for all of the industries where—as in dairy practice—it has set new standards of performance. When you think of stainless steel, think first of Allegheny Stainless.

ALLEGHENY LUDLUM

STEEL CORPORATION, Pittsburgh, Pa.

AL

SYMBOL OF VALUE

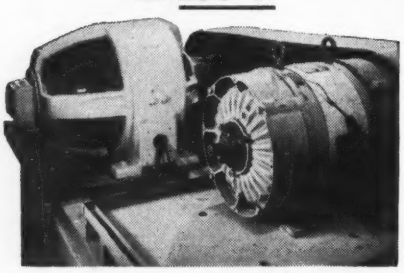
Pioneer in Specialloy Steels

Silicone News

DC SILICONES

Lubricated once with DC 44 Grease...

Bearings Run 3820 Hours at 250° F.



DC 44 Silicone Grease is tested in bearings of DC Silicone insulated motors overloaded to bring bearing temperatures up to 125° C.

DC Silicone Greases, like other Dow Corning Silicone Products, permit operation at temperatures far above and below the limits of comparable organic materials. The Silicone Greases were, in fact, developed to solve a high temperature problem of our own making.

We had developed and were testing DC Silicone Insulation for electric motors. We operated test motors at 200° to 310° C. and found that Silicone Insulation could take such temperatures for thousands of hours. We knew, however, that there would be almost no immediate market for this new class of electrical insulation unless a grease having comparable heat stability was developed.

Then one of our research groups developed DC 44 and DC 33. That was over two years ago. DC Silicone Greases have since been extensively tested and widely used.

DC 44 has proved to be serviceable from −40° to 350° F. and at speeds up to 20,000 r.p.m. It is also characterized by very low volatility, freedom from gumming, bleeding of less than 2% after 16 hours at 110° C. (230° F.), and weight loss of only 3.3% after 40 hours at 175° C. (347° F.).

These properties are most desirable in a grease for permanently sealed bearings. DC 44 is now used for that purpose.

DC 33 has proved to be a very useful grease over the temperature span covered in aircraft operations. It is serviceable at temperatures as low as −70° F. and still has better high temperature performance than special high temperature petroleum greases. Both of these DC Silicone Greases are described in data sheet No. O 7-4.

DOW CORNING CORPORATION
MIDLAND, MICHIGAN

New York • Chicago • Cleveland • Los Angeles
In Canada: Fiberglas Canada, Ltd., Toronto
In England: Albright and Wilson, Ltd., London

Dow Corning
FIRST IN SILICONES

The tank is automatically operated, with adjustable temperature range of 100 to 250 deg. F. When the tank is first filled with wax, it requires six to eight hours to thoroughly melt it. It takes an additional two to four hours to cool the wax to proper dipping temperature. Once the tank is in operation, it is refilled by placing a slab of wax in the preheater. The wax melts in the preheater, and flows by gravity into the main reservoir. No time is lost in refilling, unless the dipping operation is required to coat over 1000 lb. of product per hour.

Commercial Application

Wallis Systems is not at present encouraging the use of thermoplastic wax dip coating on a commercial basis. For straight line operations, however, several types of continuous dipping machines have been developed. It is possible that frozen foods may be coated with thermoplastic wax this year on a commercial basis.

On one conveyor dipping machine, frozen foods are dipped or dragged through the liquid wax. A dipping cord is not required to hold the food while the coating is applied. An operator places the frozen products on a conveyor which carries them through the tank containing the wax. Products are then conveyed by gravity through another compartment containing a solution which tempers the coating. Labels are placed on the coating with a low temperature adhesive.

—End—

Container Strength

(*Continued from page* 79)

pendulum can be released from an elevation of only 45 degrees. When released from this height, the energy of the pendulum is only one-third of normal, which permits the scale to be greatly opened up. This modified test has been used recently by the Bureau of Standards in Washington in tests made on various grades of waterproof case lining papers.

Index of Stiffness

Numerical values of puncture tests results do not correlate with bursting test values for the reason that the former measures some qualities of corrugated board, such as stiffness, which the latter does

Motor or Pulley Drive Optional

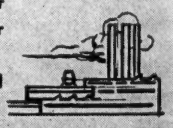
The Zenith Pulp Press, with capacity up to 26 tons per hour, thoroughly dewaters wet pulps and slurries such as:

Beet Pulp • Citrus Wastes • Tomato Pomace • Cherries • Corn Fibre • Paper Pulp • Reclaimed Rubber, etc.

Heavy screw-type spindle applies smooth, continuous pressure, forces pulp or slurry against selective resistance. Rifle drilled resistors permit use of steam when necessary. Minutely perforated screens assure efficient drainage, hold pulp losses to minimum. Ball thrust bearings and oversize shaft bearings reduce power load.

New uses for the remarkably efficient, profitable Zenith Pulp Press are being constantly developed. An experimental press is available for trial in your plant.

Write for full information.



JACKSON & CHURCH CO.
SAGINAW, MICHIGAN

More sales within easy reach

If you make any products where appealing taste is a selling influence let Ethavan* help you put more sales within easy reach.

Ethavan is Monsanto's Ethyl Vanillin. Its flavor is more distinctive than that of vanillin, its odor more pronounced, more pleasing. Even when products are subjected to high or low temperatures in processing, its individuality has remarkable "staying power." It is practically three times stronger than vanillin — more economical to use.

If you wish to experiment with Ethavan, send for samples. Make your own tests and see how Ethavan can help you put more sales within easy reach... Contact the nearest Monsanto District Office or write: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri. District Offices in New York, Chicago, Boston, Detroit, Cleveland, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

* *Reg. U. S. Pat. Off.*

MONSANTO CHEMICALS

SERVING INDUSTRY... WHICH SERVES MANKIND

SILV-A-KING
Lighting Equipment
A complete line of quality lighting units from a single source.
COMMERCIAL
INDUSTRIAL
FLUORESCENT
INCANDESCENT
SILV-A-KING lighting equipment has been incorporated in major installations, throughout the country, for over a quarter-century . . . a tribute to craftsmanship . . . to modern manufacturing methods . . . to a continuing program of research into every phase of illumination.
SILV-A-KING Lighting Equipment is sold exclusively through recognized electrical wholesalers.
SILV-A-KING
LIGHTING EQUIPMENT
BRIGHT LIGHT
REFLECTOR CO. INC.
subsidiary of
BRIDGEPORT PRESSED STEEL CORP.
Bridgeport 5, Conn.
RLM

not. Taking a variety of different corrugated boards of the so-called 200-lb. grade, which might show bursting test results of from 190 to 225 lb., the puncture test results would spread over a much wider range. The boards made from good material and well fabricated might have a puncture test value of as high as 260 puncture test units. Board of poor material, on the other hand, with crushed corrugations, and possibly with the facing sheets not firmly glued to the corrugated sheet, might show a resistance to puncture as low as 130. For double wall corrugated boards, because of their high degree of stiffness, the puncture test values will in general be considerably above the bursting test values. Double wall corrugated board having a bursting strength of 275 lb. may show a puncture strength of 450 P.T.U.'s.

V-1 and V-2 Cartons

At the urgent insistence of the armed forces during the war there were developed water resistant fiberboard containers of very high strength. Development of these boxes permitted overseas shipment of food supplies to locations without warehouse protection from the elements and frequent unloading in open boats with occasional immersions in salt water. The sturdiest grade of these boxes, known as V-1, was so strong that no existing board testing equipment could be used to measure its strength. This board had a resistance to puncture of approximately 800 P.T.U.'s. The next lighter grade, known as V-2, showed a resistance to puncture of approximately 700 P.T.U.'s.

Measures Wrapping Papers

The puncture tester can also be used to measure the strength of wrapping paper. For ordinary kraft wrapping paper, it has no particular advantages as tensile and tear tests give satisfactory results. For waterproof papers, on the other hand, the puncture tester is especially useful as other satisfactory means of testing are not available. These waterproof papers usually consist of one or more sheets of kraft paper and a layer of asphalt. Sometimes they are re-enforced with scrim or sisal threads. Often they are crinkled or creped to conform to regular shaped objects. These papers are extensively used for the lining of boxes to be shipped overseas, and also for the covering of machinery and other apparatus shipped in open crates. The cheaper grades, consisting only of krapt paper laminated with asphalt, have a

For Peak Performance when you need it most.

The wide fluctuations in food production call for the most modern refrigeration systems. These systems must be designed to give peak performance when a crop is being processed, yet so arranged that you will not be saddled with wasteful, inefficient operation in slack periods.

General Electric engineers have designed dependable, automatic refrigeration equipment, using safe "Freon" refrigerants. They are also training men in the proper application of this equipment to meet food field requirements.

See your G-E distributor or contractor today. Find out how he can help you improve your profit picture through the proper application of modern G-E refrigeration equipment. *General Electric Company, Air Conditioning Dept., Section 7064, Bloomfield, N. J.*

GENERAL ELECTRIC

MAKE A

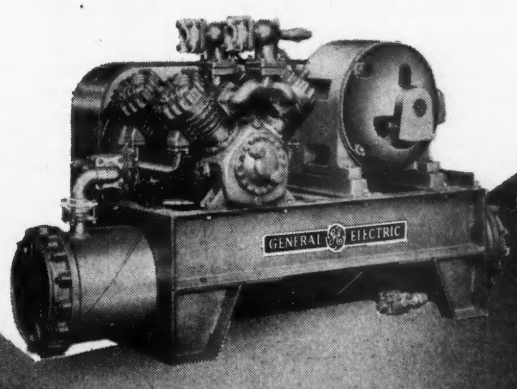
GENERAL ELECTRIC

CONDENSING UNIT

THE HEART OF YOUR

REFRIGERATION

SYSTEM



REPAIRS SPEEDED
DOWNTIME REDUCED
COSTS CUT . . .

by LUNKENHEIMER
Interchangeable Parts

IRON BODY
150 lb. S. P.
"FERRENEWO"

BRONZE
200 lb. S. P.
"RENEWO"

In servicing the Bronze "Renewo" and Iron Body "Ferrenewo" Valves—both regular and plug types—only ONE STOCK OF PARTS is required. ALL parts (except bodies and bonnet rings) are exactly the same and fit each other perfectly.

For example—if you need a stem, disc, or seat ring for the "RENEWO", you can use the corresponding part of the "FERRENEWO" and vice versa.

Repairs are more quickly and easily made, ordering and handling are simplified. The result: Lower maintenance cost and low ultimate valve cost.

Lunkenheimer part-interchangeability is fully illustrated and described in Circular No. 567.

Ask your Lunkenheimer Distributor for a copy, or write direct

Fig. 16
Bronze Regular
"RENEWO"

Fig. 16-R
Bronze Plug
Type
"RENEWO"

VALVE MAINTENANCE SIMPLIFIED!

There are fewer parts to be carried, repairs are more quickly and easily made. The labor, time, and expense of valve maintenance is cut down—'way down!

SAVE THIS WAY, TOO!

For severe throttling service, a regular type can be converted into a plug type, by simply changing the seat and disc, without taking the valve out of the line.

Thus it's not necessary to buy a whole new valve—just a matched set of plug type seat and disc which interchange perfectly in corresponding patterns and sizes in a range of pressures from 150 to 350 lb. S. P.

Lunkenheimer simplicity of design, minimum number of parts, and fine precision workmanship make this and other outstanding economies possible.

SEE YOUR LUNKENHEIMER DISTRIBUTOR!

Lunkenheimer Distributors are located in all industrial centers. There is one near you—have him demonstrate with actual samples the interchangeability of parts in "RENEWO" and "FERRENEWO" Valves. It's a big time and money saver for any plant!

THE LUNKENHEIMER CO., Cincinnati 14, Ohio
(OFFICES: NEW YORK 13, CHICAGO 6, BOSTON 10, PHILADELPHIA 7.
EXPORT DEPARTMENT: 318-322 HUDSON ST., NEW YORK 13, N. Y.)

resistance to puncture of from 10 to 15 P.T.U.'s. The addition of scrim re-enforcement between the laminations raises the resistance to puncture to values between 20 and 35 P.T.U.'s. If in the process of lamination the kraft paper is creped, the resistance to puncture will be increased to values between 45 and 55 P.T.U.'s.

Investigation of the puncture tester by the Institute of Paper Chemistry showed, according to a paper presented to the Technical Association of the Pulp and Paper Industry, that "the results obtained by the puncture tester coordinate most closely with the serviceability of the boxes," and that "the standard error is remarkably low." This method of testing has now been adopted as tentative standard by the American Society for Testing Materials and the Technical Association of the Pulp and Paper Industry. Its use in the food industry has not yet become widespread, but has proved effective in a number of instances and appears likely to increase as more and more attention is devoted to container testing.

—End—

Milk Processing

(*Continued from page* 94)

It seems reasonable to assume that any major broadening of the base of diversification will be found in dairy-products manufacturing plants as compared with the processing-distributing plants. The latter plants are located most often in urban or suburban communities. Furthermore, the processing-distributing plant, engaged primarily in market milk and allied fluid products, will have to increase its refrigeration before it can consider any frozen-food developments. Its location, in most instances, probably will prevent its engaging in such operations to an economic advantage when compared with the country plants located for the most part in agricultural communities and engaged in manufacturing dairy products. It would therefore seem more logical for the processing-distributing plants to develop frozen-food locker storage and/or distribution facilities; not processing.

However, a dairy manufacturing or processing-distributing plant engaged in the production of eviscerated poultry or frozen eggs, as well as those engaged in the manufacture of ice cream or operated in

Identify Your Dealers COAST TO COAST

With MEYERCORD DECAL SIGNS

"SELL" DEALERS, SELL PRODUCTS WITH SPOT DECALS AND VALANCES!

Alert advertisers use low-cost Meyercord Decals as spot signs and window valances at the point of sale. They're far more than dealer identification. They are full-color ads in themselves . . . constant sales reminders on store windows, doors, showcases and backbars. They cash-in on impulse, create buying urge, follow through until the sale is made. Learn how Meyercord Decals Signs can give advertising impact to your company name, product illustration or trademark. They're specially processed for years of use—in any colors, size or designs. They're washable, durable, easily applied.

Exclusive Meyercord methods make it economical to personalize Decals—providing each dealer individual signs with his name, street number and panels describing his business for display on America's "buy"-ways.

Send for Meyercord's full-color Decal-Sign "Advisor" Brochure. It's FREE. *Shows where and how to use Decals. Address Dept. 65-4.*

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World's Largest Decal Manufacturer
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ADVERTISE • IDENTIFY • DECORATE . . . WITH MEYERCORD DECALS

In-Plant Chlorination

Gets behind the ears!

Yes, WASH WATER and other food process water sterilized by IN-PLANT Break-Point Chlorination does a "Saturday night" job every day — reduces production losses and off-flavors — and speeds clean-up. For details of this field proven money-saving quality insurance, write to:

Industrial Dept. F-2

I-5

WALLACE & TIERNAN COMPANY, INC.

MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

An Independent • Laboratory

to meet the needs of your Organization

WE are eager to have your firm as one of our many clients and will be glad to advise you (without obligation on your part) as to how we can assist you in many matters requiring the work of an independent laboratory of established reputation and broad experience.

Food Analyses

VITAMIN DETERMINATION
Biological
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123 Hawthorne St., Roselle Park, N. J.

conjunction with a cold-storage locker plant or warehouse, might prove to be a logical plant to expand into frozen-food processing and handling. In fact, those which already have expanded into frozen-food processing and handling have found the ice-cream and cold-storage locker plant effective nuclei around which to develop such expansion. It may well be that with the development of home-freezer units for storage purposes, many consumers will do their buying in an establishment where fast-freezing is a commercial operation.

For these reasons, no set rule or circumstances will dictate an obvious trend for expansion and diversification. A careful analysis of the available markets and type of agricultural crops will prove an essential and vital prerequisite.

Incidental Equipment

Again, before speculating too enthusiastically upon the entry of a dairy manufacturing plant or processing-distributing operation into the frozen-food business, a brief and critical review of the essential practices and incidental equipment involved in preparing foods for fast freezing becomes important.

Entry of a milk-products company into the frozen-foods business might be either as a distributor or as a processor. For the distributor, the essential facilities are 0 to 10 deg. F. storage and refrigerated truck service such as an ice cream manufacturer or distributor would have. A deterrent factor for the milk-products company functioning merely as a distributor is that it benefits financially only to the extent of a distributor's profit. If, perchance it has sufficient refrigerated storage capacity to perform also a wholesale warehousing function for the processing company, the distributor's profit can be augmented by a refrigerated-service profit. Only in isolated instances is such a business relationship with a frozen-foods processor likely to be feasible.

Supply of Commodities

As a potential processor or processor-distributor of frozen foods, the milk processor will, first of all, want to assure himself that an adequate and reasonably priced supply of the commodities to be frozen is available. Also, they should be available at a time when the cycle of activities of the milk-products plant best permits inclusion of frozen food operations. In some geographical locations, the prepara-

better products through research

Someone in your firm has the very important responsibility of reducing plant maintenance and increasing efficiency through the use of industrial cleaners. Perhaps we can be of service.

Since 1904 Pacific has been developing better cleaning products through chemistry—solving industrial cleaning problems by practical laboratory and field work. Your inquiries are invited.

Laboratory Tested — Pacific Chemical Co.

PACIFIC CHEMICAL COMPANY

Los Angeles • San Diego • San Francisco

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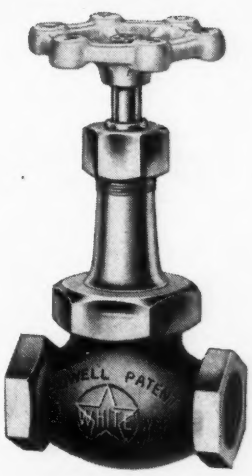
AMERICAN-MARIETTA COMPANY, CHICAGO, ILLINOIS

For assured flow control, the valve must suit the service

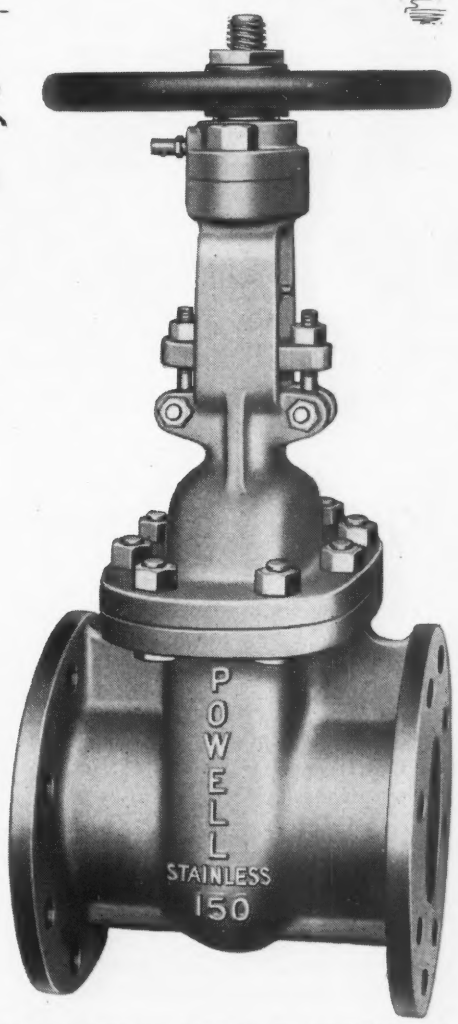
You don't have to be an Isaac Walton to know what's wrong with these fishing pictures. Silly misapplications of equipment, aren't they? But no sillier than using *valves* in services for which they were not specifically designed.

Through more than a hundred years of making valves—and valves only—Powell Engineers have been designing the *right* valves to suit the specific requirements of every existing industrial flow control service. Today, the Powell Line includes Bronze, Iron and Steel Valves of every necessary type, design, size and pressure. And, for corrosion resistance, Powell makes a notably complete line in the widest range of pure metals and special alloys ever used in making valves.

That's why, *for assured performance,* it pays to consult Powell.



Small size 200-pound Bronze Globe Valve for steam, oil, water or gas. For assured, long-life performance it has a renewable, specially heat treated stainless steel seat and a regrindable, renewable, wear-resisting "Powellium" nickel-bronze disc.



New, standard 150-pound Stainless Steel Gate Valve with bolted flanged yoke-bonnet, outside screw rising stem and taper wedge solid disc. This is one of Powell's many special designs for corrosion resistant valves which are available not only in stainless steels but also in many other alloys and pure metals.

The Wm. Powell Co.
Cincinnati 22, Ohio
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

four of a kind . . . all different

Four important members of the *Wyandotte* family of *specialized* compounds are: Wyandotte G.L.X.* . . . Wyandotte S.R.-10 . . . Wyandotte Citrifoam* . . . Wyandotte Steri-Chlor*. All give quick, safe and effective results. Each fills a specific need in modern food plants.

For high-temperature, high-speed pasteurizing systems or for general cleaning of all types of food-processing equipment, Wyandotte G.L.X. is unsurpassed.

Wyandotte S.R.-10, a mild acid-type product in crystalline form, is effective for removing certain kinds of soil and scale deposits from food processing equipment.

Wyandotte Citrifoam gives excellent results with spinach, for example, in a wet tumble-wash . . . with asparagus, for example, in a warm-water soak . . . and as a container rinse or wash when packing in glass.

As a germicidal rinse for *all* equipment, Wyandotte Steri-Chlor insures greater protection and increased sanitary control. It is invaluable, too, as a germicidal rinse for workers' hands.

Let your Wyandotte Representative show you how well these products can work in *your* plant. He's always at your service—and as near as your telephone.

*Registered trade-mark

Wyandotte
REG. U. S. PAT. OFF.

WYANDOTTE CHEMICALS CORPORATION

WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES

tion and freezing of poultry, game, or carcass meat will best fit into the low segment of the cycle of milk-processing plant activities. In other locations, small fruits, early vegetables, or broken-out eggs will work out best and in still other locations, late fruits and vegetables offer the greatest promise.

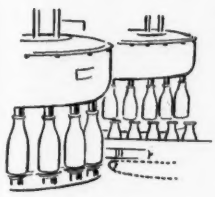
In any case, the milk-processing plant engaged in freezing operations will require a preparation department and facilities quite apart from the milk receiving, handling and processing department of the plant; although they might be under the same roof or be in contiguous buildings. The combination plant permits use of the same plant services facilities as heat, light, water, power, refrigeration, refrigerated storage, shipping and plant housekeeping.

Refrigeration for processing purposes requires attainment of lower temperatures than does refrigeration for the storage of frozen foods. Temperatures ranging from —5 to —20 deg. F., at least, are required for the processing. Maintenance of those temperatures for commercial purposes also requires a differently constructed room than do storage temperatures of 0 to 10 deg. F. The temperature needed in the freezing room or machine varies with the commodity being frozen and with the size or mass of the units in which they are frozen.

Just as a well-run milk-processing plant needs a laboratory staff and production force with experience to make milk products of a desired quality and uniformity, so will it need the equivalent technical and experienced personnel to make marketable frozen-foods. Frozen-foods processing has as many, perhaps more, technical problems and pitfalls than does milk-processing. Some of the problems are similar and some are highly dissimilar, depending upon the commodity being frozen and the manner in which it is to be packaged and marketed. To the uninitiated milk-processor who is considering entry into the frozen-foods business, a familiarity with the contents of "The Freezing Preservation of Foods" by D. K. Tressler and C. F. Evers is recommended.

Adherence to correct processing and packaging methods and practices is as important in the production of frozen foods as it is in the processing of milk. Attempts to cut corners by using raw materials of low or questionable quality, or by failing to observe effective technical

Nothing is more precious than the Purity of your products

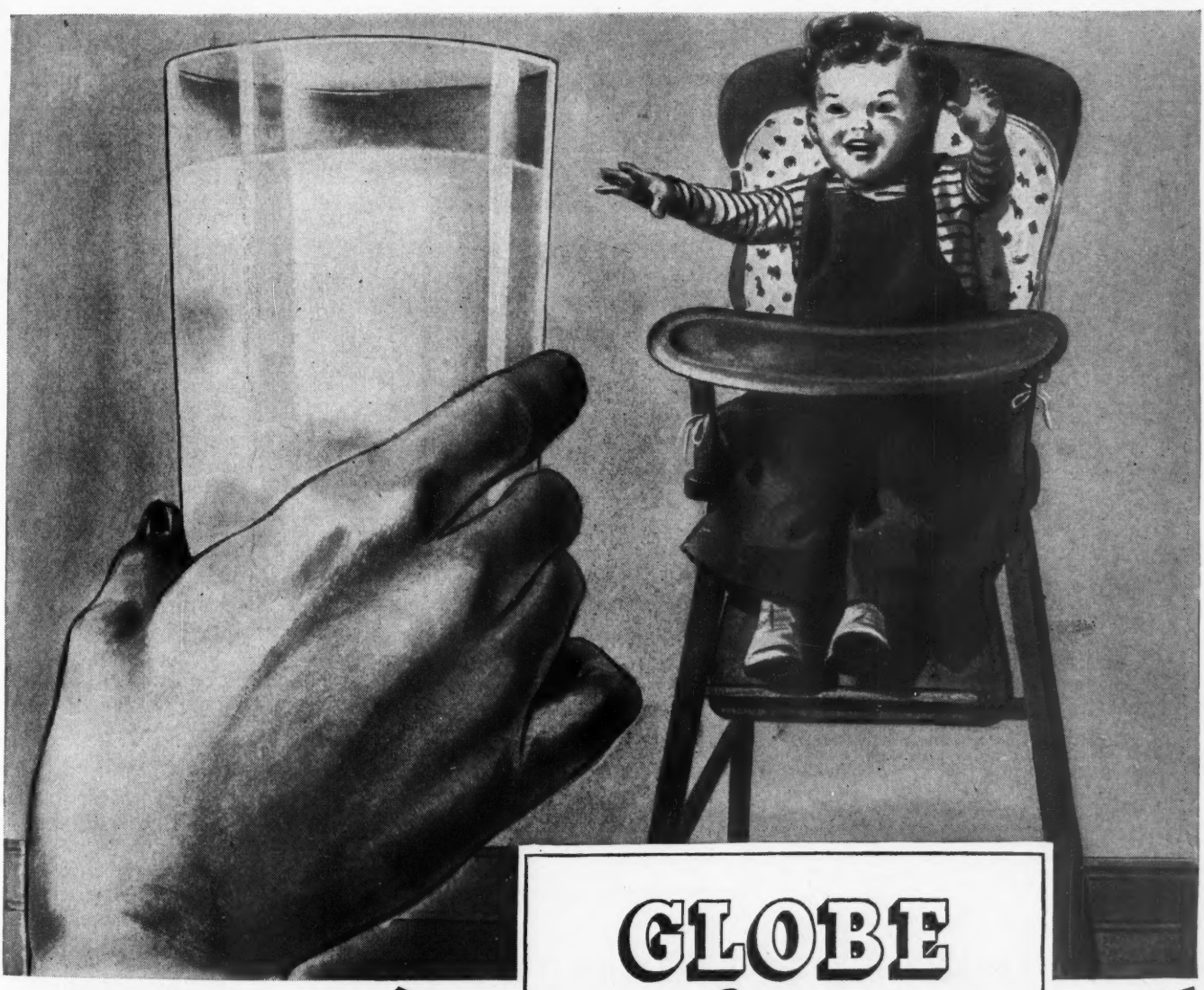


Of course you won't take chances on the purity of your product — that's the most important reason for using stainless steel tubing in your processing machinery and equipment.

At the same time don't overlook the costs involved in the operation and maintenance of processing equipment. No other tubing equals stainless steel in long service life and resistance to corrosion in most food and chemical processing applications — no other tubing is so easily kept clean and sanitary without impairment of the tubes themselves.

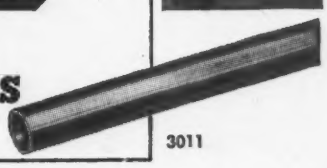
To gain the most in stainless tube advantages, select with care — not just any stainless steel analysis will do for all jobs. Consult with Globe — as specialists in tubing manufacture and a broad experience record in stainless steel tubing (both seamless and welded) we offer valuable advisory technical service to both builder and user of processing equipment.

Globe Steel Tubes Co., Milwaukee 4, Wisconsin.



Write for Bulletin No. 115 and complete information on Globe Seamless Stainless Steel Tubing and Gloweld Welded Stainless Steel Tubing.

GLOBE
Stainless
STEEL TUBES



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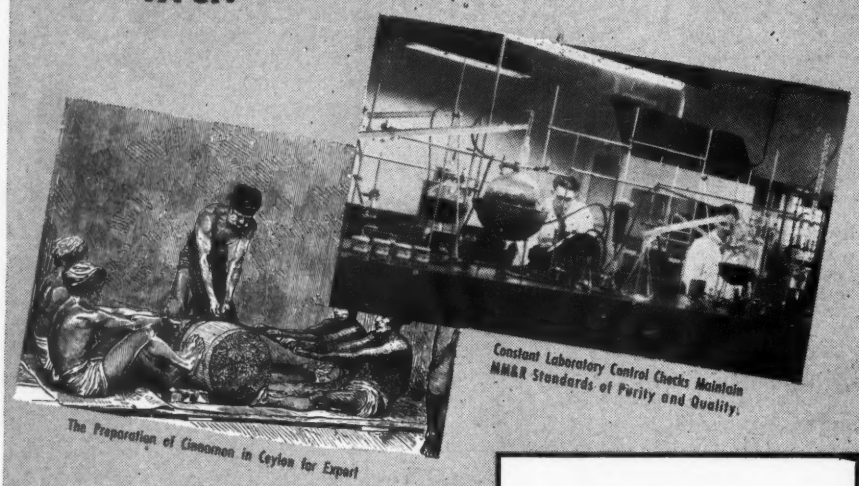
Which Has Greater Purity?



The Preparation of Cinnamon in Ceylon for Export

Constant Laboratory Control Checks Maintain MM&R Standards of Purity and Quality.

The Answer is one of 11 reasons Why You Should Use

MM&R SPICE OILS for MODERN FLAVOR CONTROL

Of course there's a distinct possibility of introducing dirt and other contaminating and mold-producing substances into your product when you use dry spices—a danger that you can eliminate entirely through the use of MM&R Spice Essential Oils and Spice Oil Mixtures. For MM&R *liquid* spices are uniformly pure and wholesome... the laboratory-distilled *essence* of natural spices, free from all extraneous matter.

And that's not all—highly-concentrated spice oils are more economical . . . easier to handle and store . . . provide uniform distribution of flavor without color disturbance.

These are just a few of the 11 reasons why producers find a *better* flavoring job is being done by Spice Essential Oils . . . *the MM&R brand* . . . pioneer and pacesetter in the field of Spice Oils for the food industry.

1. Uniformity of quality and flavoring
2. No color disturbance
3. Less bulk in storage
4. Less weight in shipping
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6. No loss by exposure in package while being stored
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control over processing operations, may result in finished products that will become unmarketable during storage.

Summary

The milk processor who expands his operations to include diversity of finished products must take into account: 1, Type of plant he intends to operate; 2, location of plant with respect to raw materials supply and to markets for finished products; 3, potential as well as existing intercommodity competition; 4, operating plus technical problems to be contended with and 5, quality and storage life of finished products. Finally, it must be realized that processing, including freezing, is no substitute for critical selection of raw materials, for observance of correct processing practice or for adequate protective packaging, storage and shipping.

—End—

Army Tests

(*Continued from page* 102)

frozen field rations, and then heat them to 175 deg. F. Heated rations are then placed in insulated containers, where the heat will be retained for 24 to 36 hours. The conditioner is also used to make water from snow where drinking water facilities are not available.

Drop Tests From Planes

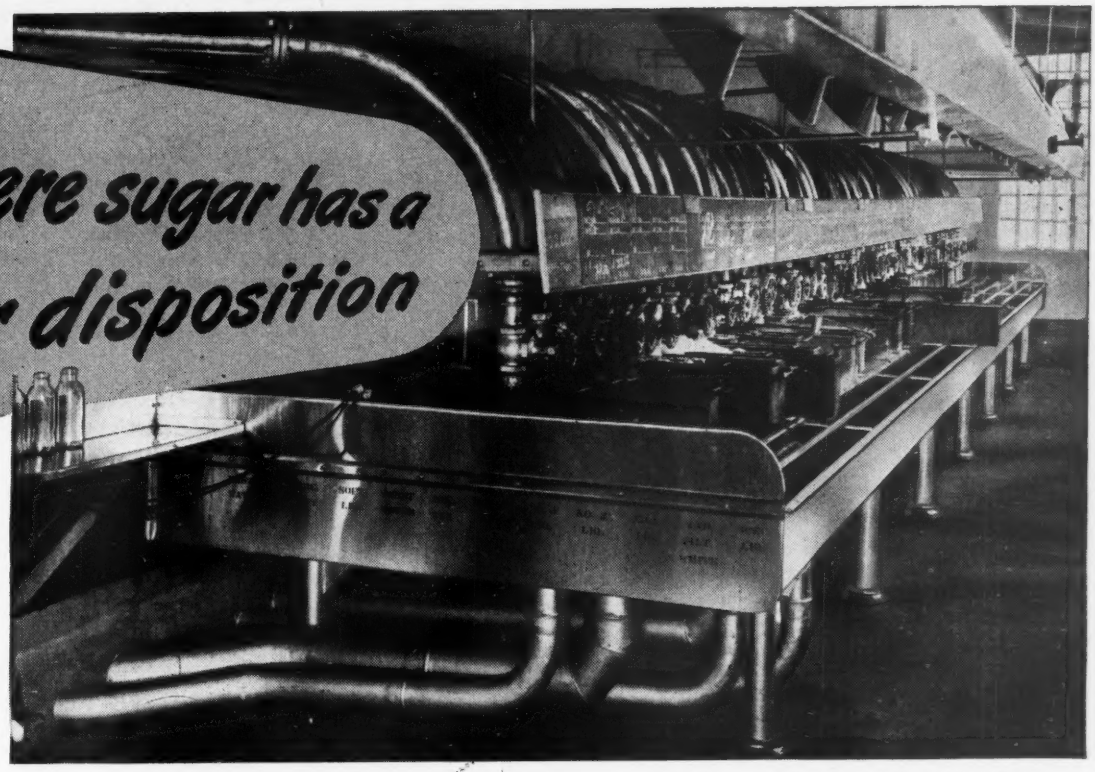
The 43 lb. carton of operational rations has been subjected to all conditions encountered in winter warfare. It has been air-dropped from L-5 liaison planes, both by free dropping at 100 ft. on soft, spongy and frozen ground, and by parachuting. In all cases the packaging has been generally satisfactory. Air dropping of foods is an emergency supply measure. It is being used to supply troops in places where the tactical situation denies use of normal supply methods.

Exposure Tests

Cases of rations, covered with tarpaulin, are being exposed to winter conditions for two years. The foods and packages are being tested every six months to determine the deteriorative effects of winter conditions on foods in their present types of packaging. At the end of the two year period the food will be shipped to the Chicago Quartermaster Corps where final analysis of the rations will be made.

—End—

Where sugar has a sour disposition



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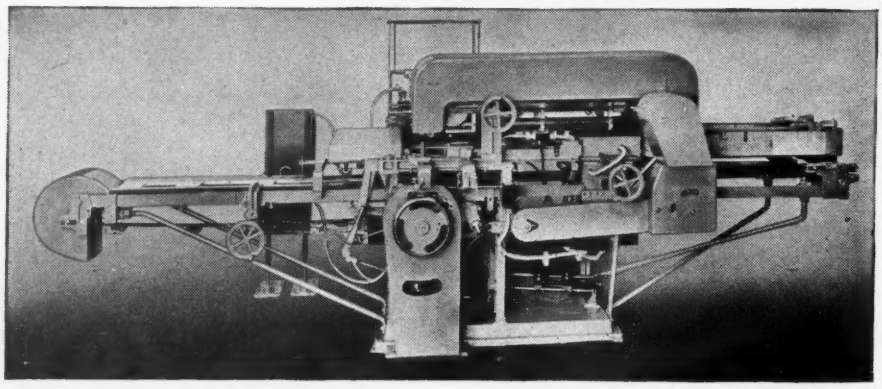

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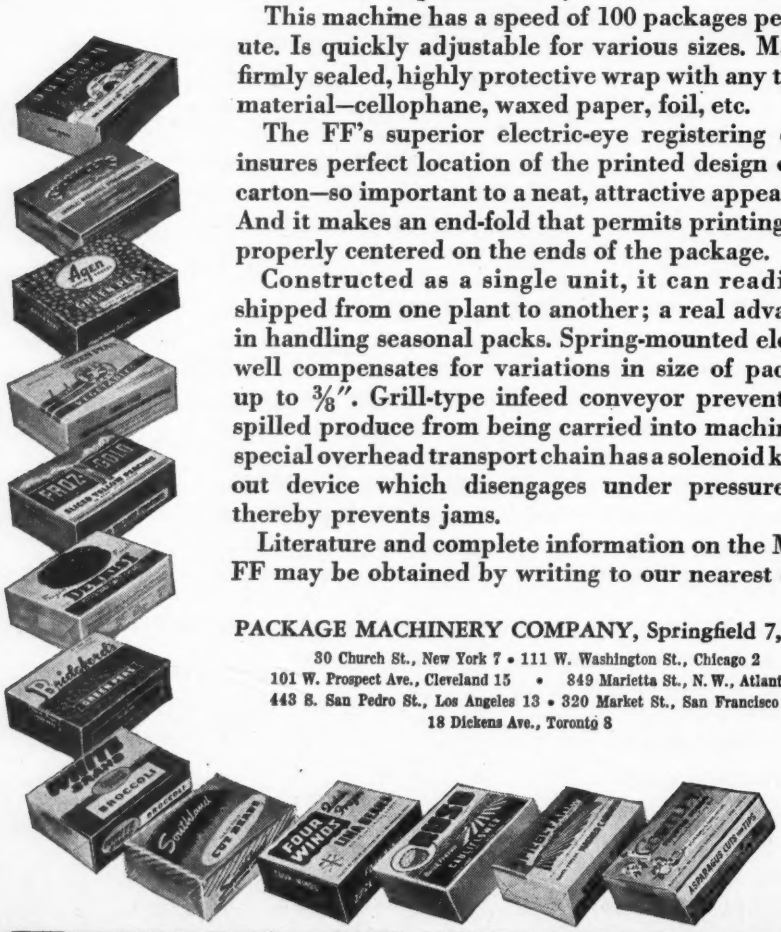
Literature and complete information on the Model FF may be obtained by writing to our nearest office.



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PACKAGE MACHINERY COMPANY

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Spray Dried Eggs

(*Continued from page* 110)

20 percent sucrose, 10 percent lactose, 10 percent invert sugar, 10 percent light dextrin and 10 percent dark dextrin were added before dehydration, were used in a series of chemical, cooking, and flavor tests before and after 1, 4, 8, 16, and 32 weeks' storage at 100 deg. F.

All Satisfactory at First

Initially, all treated eggs resulted in satisfactory popovers and baked custards, but were not palatable as scrambled egg. Dried egg with 20 percent sucrose was superior for making sponge cakes; 10 percent sucrose and 10 percent lactose were slightly less effective than 20 percent sucrose; invert sugar and dextrin were poor.

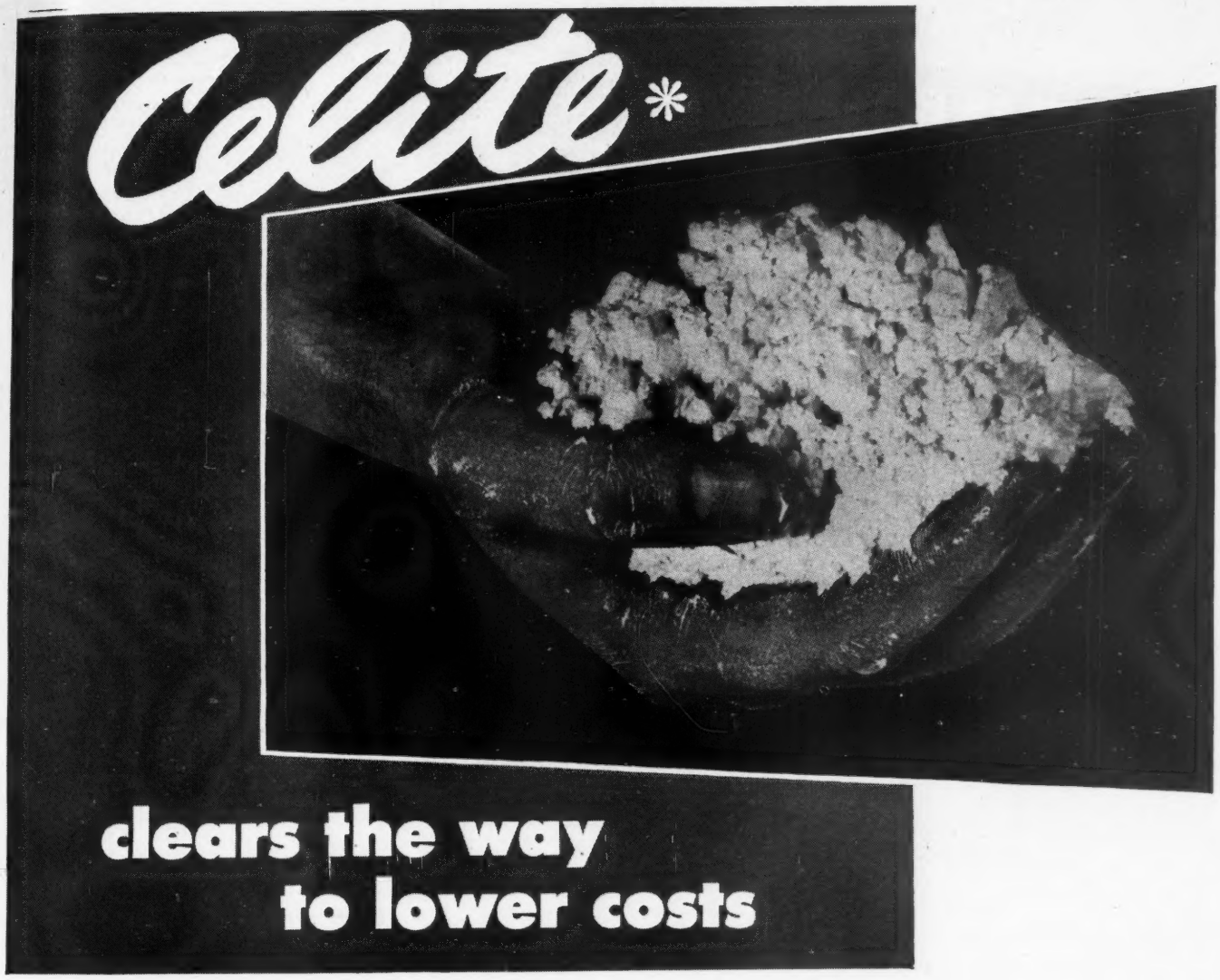
Spray-dried egg incorporating 10 percent lactose retained its initial qualities for 8 weeks when stored at 100 deg. F., as compared with 1 week for the untreated samples. Addition of 20 percent sucrose prevented serious deterioration of dried egg up to 8 weeks except for use in making popovers; loss of foaming power in this sample occurred between 8 and 16 weeks in storage. Ten percent sucrose was inferior to 20 percent sucrose and 10 percent lactose treatments. Addition of dextrin and invert sugar prolonged storage life very little with respect to general cooking quality.

Flavor and Cooking Quality

The relationship of flavor and cooking quality to such chemical properties as fluorescence and solubility was studied. Deterioration in baking quality in making popovers was found to be accompanied by an increase in fluorescence. In general, decrease in solubility was related to poorer cooking quality. No change in solubility occurred in the egg samples treated with 10 percent lactose and 20 percent sucrose through 8 weeks' storage at 100 deg. F., and these samples gave the best results in cooking.

Conclusions

These findings suggest long storage possibilities for sucrose- and lactose-treated eggs held at lower temperatures. Due to its superiority in preserving foaming power, the addition of 20 percent sucrose to dried egg is preferred for use in making sponge cakes, whereas 10 percent lactose is preferred for general use, except in scrambled eggs,



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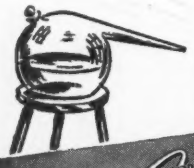

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where its sweetness rendered it unacceptable.

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—End—

Trichinosis

(*Continued from page* 99)

to decide from the evidence whether there has been a breach of such warranty in the sale of pork, in this case salami, which causes injury.[23] In New Hampshire a case brought under the theory of implied warranty was thrown out of court for failure to give notice within the time required by law.[24]

In the State of Washington liability has been allowed.[25] In Texas a manufacturer has been held liable on an implied warranty for disease and death due to the consumption of a sausage.[26] The report in this case does not indicate whether the pork contained trichinae or not, but the legal principle is the same.

Decisions in Twelve States

All of these cases, as here collected for the first time, represent decisions of appeals courts in only twelve states. They are, however, precedents and as such are part of the law. If similar litigation occurs in other states, as is more than likely, these decisions point the way to adjudication in the other jurisdictions.

The general rule, then, is that pork, infected with trichinae, which

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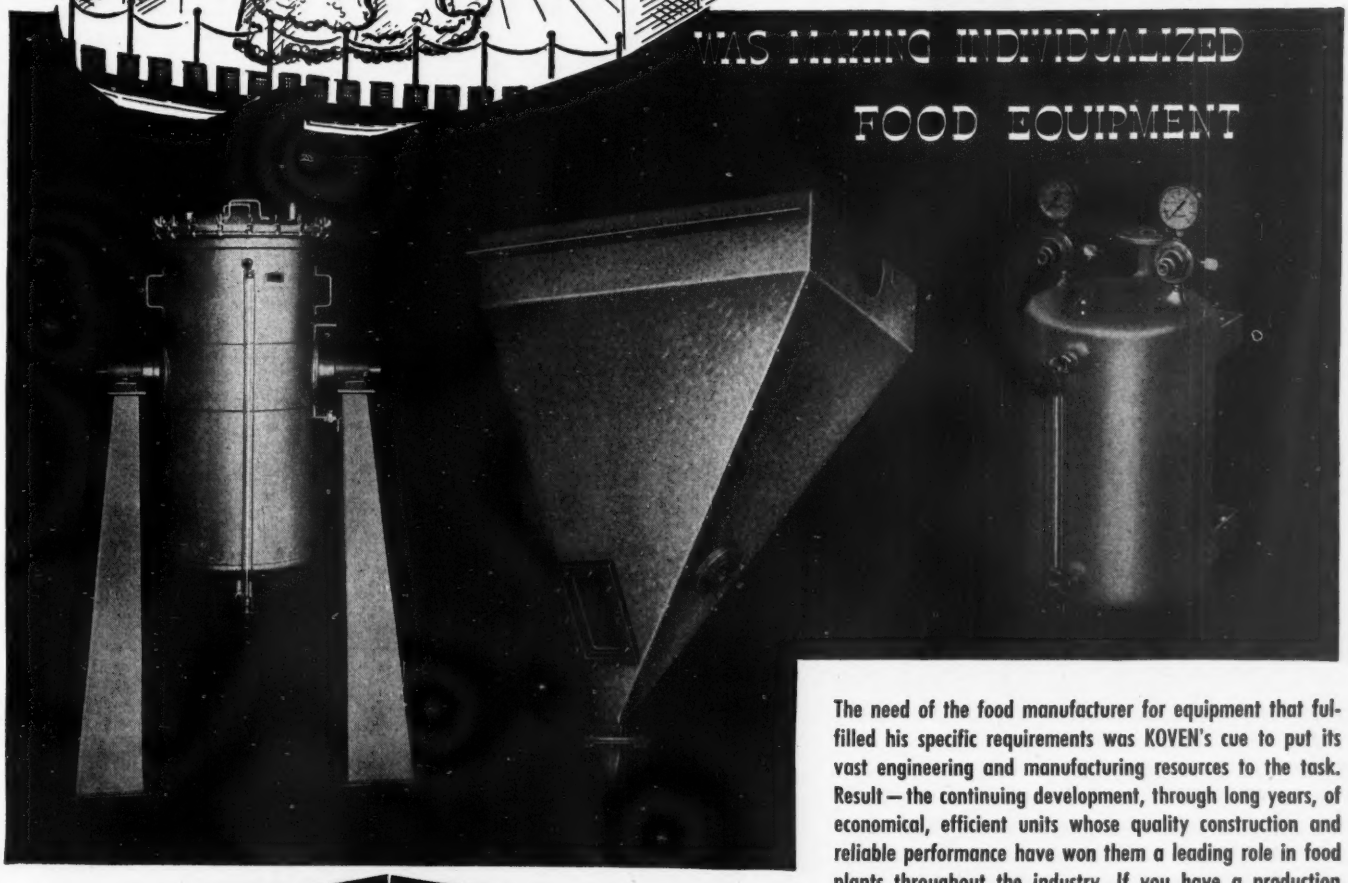

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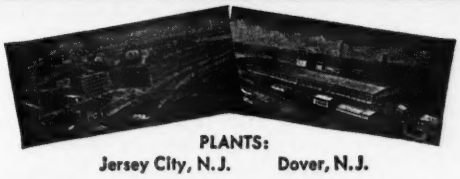

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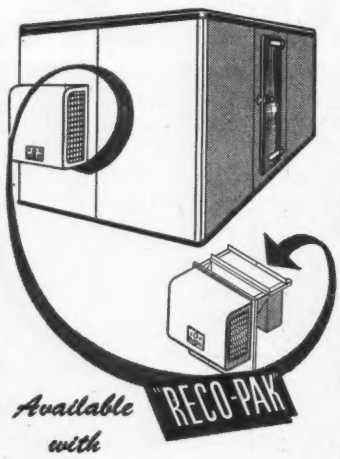

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is sold for human consumption only after proper cooking, usually can not be considered an unwholesome product which will give rise to an action for negligence. Such an action, however, may be valid if the product is sold for consumption without cooking, or is sold when improperly cooked by a restaurant keeper. Disease due to trichinae-infected pork will, however, sustain an action for breach of implied warranty as to the fitness of the food for the purpose intended, at least in a number of states, and perhaps in many.

For these legal reasons, as well as for the moral responsibility involved, it behooves all producers, manufacturers, and others concerned to endeavor to exercise due care in the production and sale of pork and pork products.

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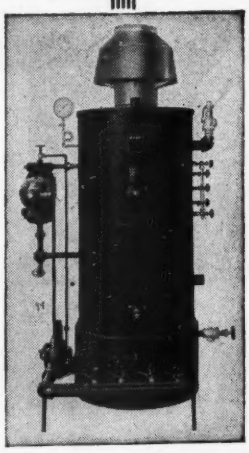

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